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Revision History		
Revision	**Revision Description**	**Date**
1.0	Application Notes Release	2005/12/28

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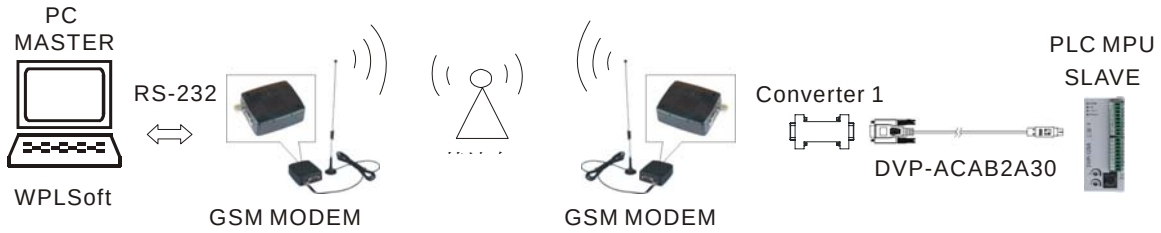
5 applications:

CONNECT1：GSM MODEM ⇔ GSM MODEM (see Note1) (Please refer to Example 2)

a) In Master site, connect PC to GSM MODEM via COM port (RS-232).

b) Connect the GSM MODEM in Master site to the MODEM in Slave site of PLC MPU via SIM card dialing.

c) In Slave site, connect GSM MODEM to PLC MPU COM1 (RS-232) via converter 1 (see Note 2) and DVP-ACAB2A30. Or GSM MODEM can directly connect to the COM2 (DVP-F232) of EH MPU via RS-232 (see Note 3).



Note1: the SIM card phone number of the GSM MODEM should be specific number of mobile MODEM (phone number is provided by local telecom carrier)

Note2: regarding of Converter 1 information, refer to the wiring method of PLC MPU (Slave) and MODEM.

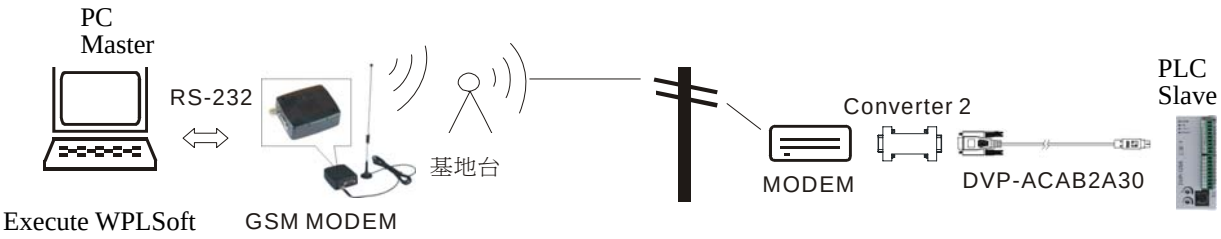
Note3: regarding connection cable information, refer to the wiring method of PLC (Slave) and MODEM.

CONNECT2：GSM MODEM ⇔ 56K MODEM (refer to Example 3)

a) In Master site, connect PC to GSM MODEM via COM port (RS-232).

b) Connect the GSM MODEM in Master site to the 56K MODEM in Slave site of PLC MPU via SIM card dialing. (see Note 1)

c) In Slave site, connect 56K MODEM to PLC MPU COM1 (RS-232) via converter 2 (see Note 2) and DVPACAB2A30. Or 56K MODEM can directly connect to the COM2 (DVP-F232) of EH MPU via RS-232 (see Note 3).



Note1: in Slave site, the phone line should be dedicated to 56K MODEM. Extension number is prohibited.

Note2: regarding Converter 2 information, refer to the wiring method of PLC MPU (Slave) and MODEM.

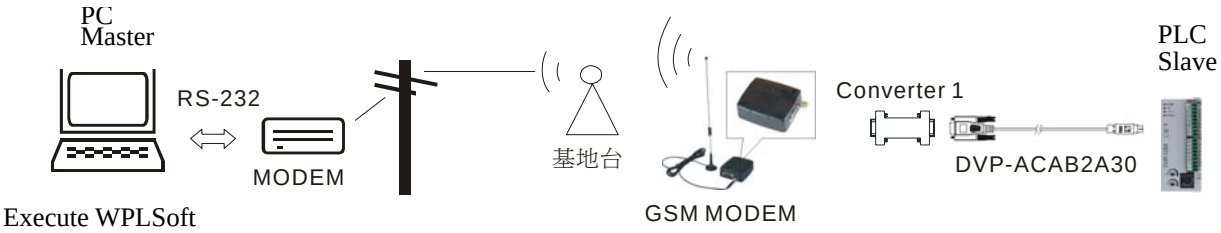
Note3: regarding connection cable information, refer to the wiring method of PLC MPU (Slave) and MODEM.

CONNECT3：56K MODEM ⇔ GSM MODEM (refer to Example 4)

a) In Master site, connect PC to 56K MODEM via COM port (RS-232).

b) In Master site, connect 56K MODEM to general phone line. By dialing via phone line, 56K MODEM will connect to the GSM MODEM of PLC MPU in Slave site.

c) In Slave site, connect GSM MODEM to PLC MPU COM1 (RS-232) via converter 1 (see Note 1) and DVPACAB2A30. Or GSM MODEM can directly connect to the COM2 (DVP-F232) of EH MPU via RS-232 (see Note 2). In Slave site, connect 56K MODEM to PLC MPU COM1 (RS-232) via converter 2 (see Note 2) and DVPACAB2A30. Or 56K MODEM can directly connect to the COM2 (DVP-F232) of EH MPU via RS-232 (see Note 3).



Note 1: regarding Converter 1 information, refer to the wiring method of PLC MPU (Slave) and MODEM.

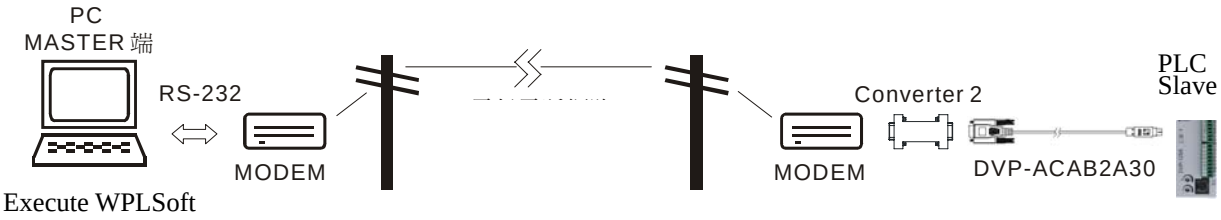
Note 2: regarding connection cable information, refer to the wiring method of PLC MPU (Slave) and MODEM.

CONNECT4：56 MODEM ⇔ 56K MODEM (refer to AppNotes document: AN09292005-56KMODEM)

a) In Slave site, connect PC to 56K MODEM via COM port (RS-232).

b) In Master site, connect 56K MODEM to general phone line. By dialing via phone line, 56K MODEM will connect to the 56K MODEM of PLC MPU in Slave site.

c) In Slave site, connect 56K MODEM to PLC MPU COM1 (RS-232) via converter 2 (see Note 1) and DVPACAB2A30. Or 56K MODEM can directly connect to the COM2 (DVP-F232) of EH MPU via RS-232 (see Note 2).

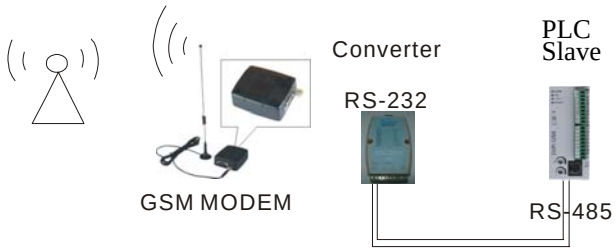


Note 1: regarding Converter 2 information, refer to the wiring method of PLC MPU (Slave) and MODEM.

Note 2: regarding connection cable information, refer to the wiring method of PLC MPU (Slave) and MODEM.

CONNECT5：PLC sends message via GSM MODEM (refer to Example 5, 6)

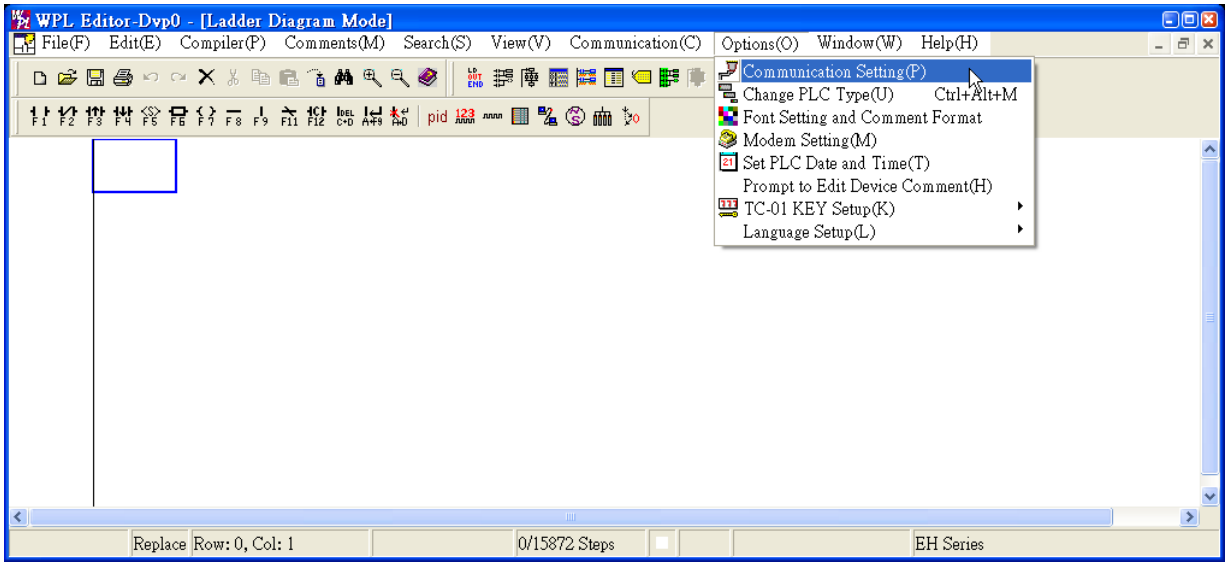
GSM MODEM connects to PLC MPU COM2 (RS-485) via RS-232 ←→RS-485. Or it can connect to EH MPU COM2 (DVP-F232) via RS-232. By using PLC program, set the PLC to send message to owner's cell phone when error happens to PLC system.



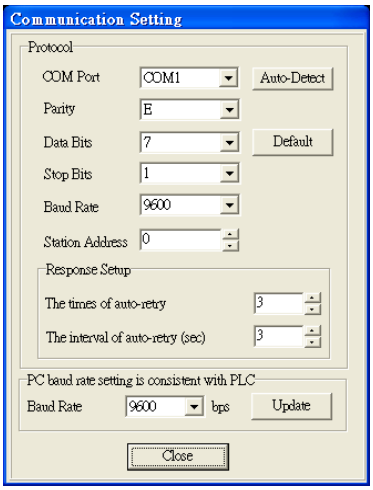
Operation Example:

Example 1: Use PC WPLSoft program to initial 56K or GSM MODEM to activate the Auto Answer function that will remain ON after re-power on.

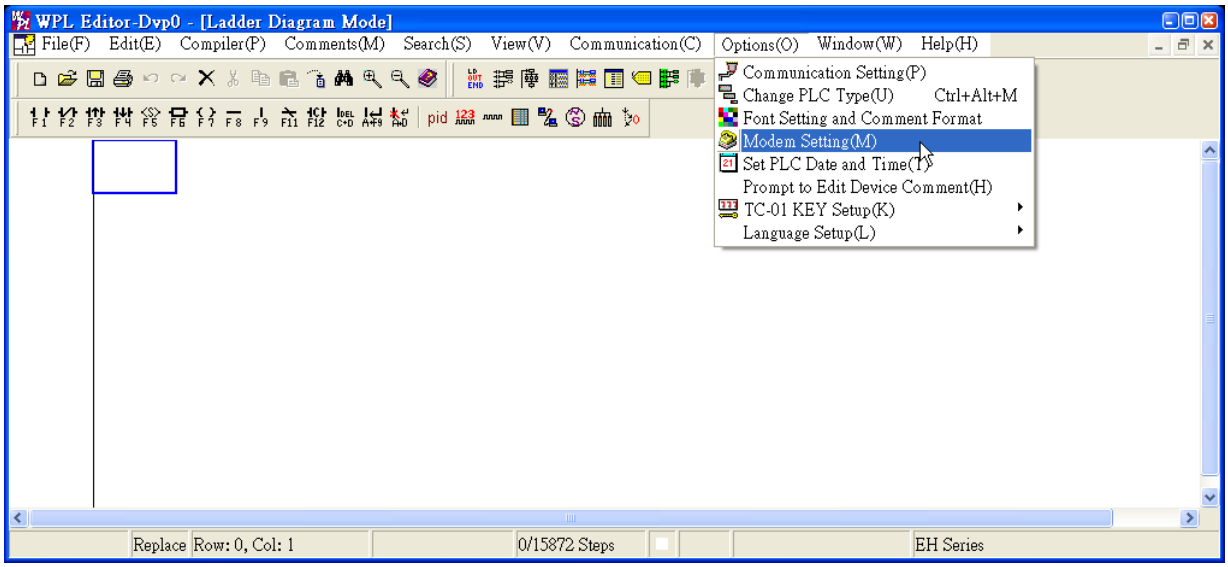
Step 1: Properly connect GSM MODEM or 56K MODEM to PC by RS-232 cable. At the same time, install SIM card in GSM MODEM (connect 56K MODEM to phone line). After that, enter WPLSoft.


WPL Editor-Dvp0 - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Communication Setting(P)
Change PLC Type(U) Ctrl+Alt+M
Font Setting and Comment Format
Modem Setting(M)
Set PLC Date and Time(T)
Prompt to Edit Device Comment(H)
TC-01 KEY Setup(K)
Language Setup(L)
Replace Row: 0, Col: 1
0/15872 Steps
EH Series

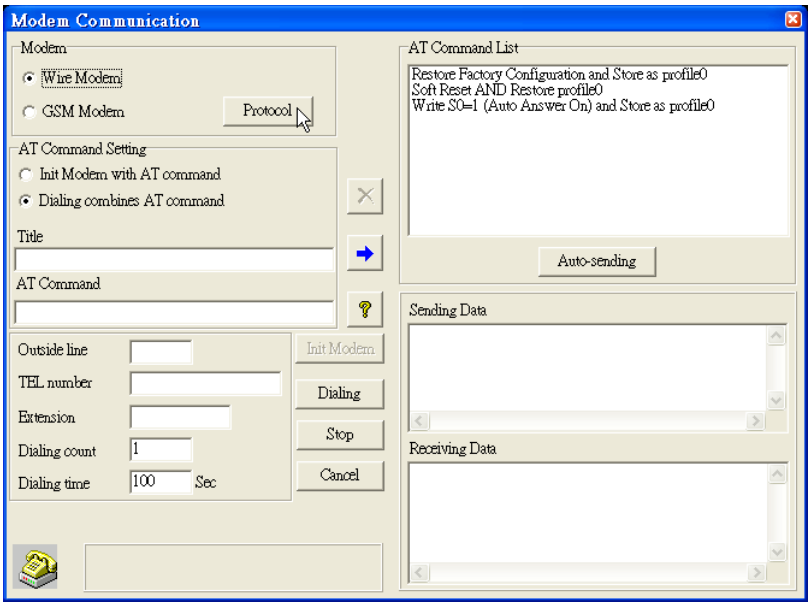
Step 2: select “Options”→select “Communication Setting (P)” to set communication port as MODEM connection port. No modification for other setting. For example: if COM1 is used to connect MODEM and PC, select “COM1” and click “OK”. See illustration as follow.



Step 3: select “Option”→”MODEM Setting (Setting)” to initial MODEM


WPL Editor-Dvp0 - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Communication Setting(P)
Change PLC Type(U) Ctrl+Alt+M
Font Setting and Comment Format
Modem Setting(M)
Set PLC Date and Time(T)
Prompt to Edit Device Comment(H)
TC-01 KEY Setup(K)
Language Setup(L)
Replace Row: 0, Col: 1
0/15872 Steps
EH Series

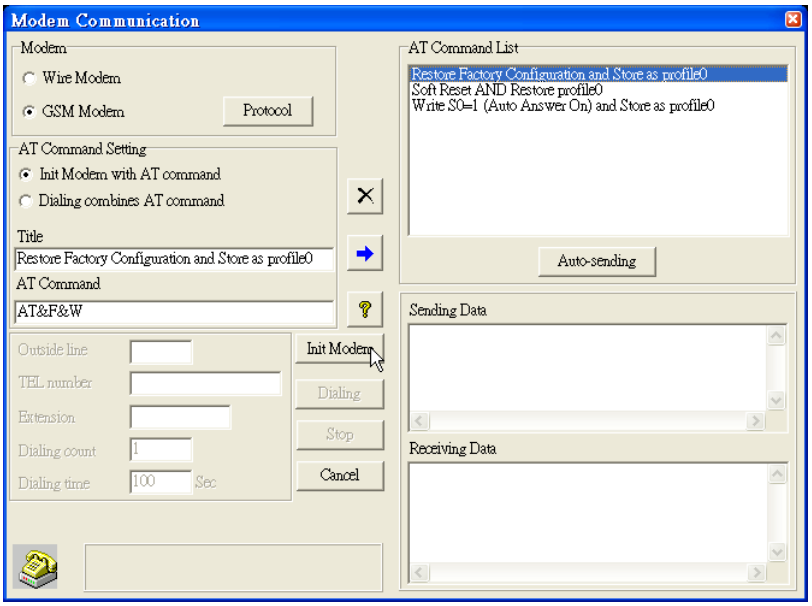
Step 4: MODEM type selection: the communication format of cable MODEM is 9600, 7, E, 1 and the communication format of GSM MODEM is 9600, 8, N, 1. (GSM MODEM and some 56K MODEM brands support 9600, 8, N, 1 only)



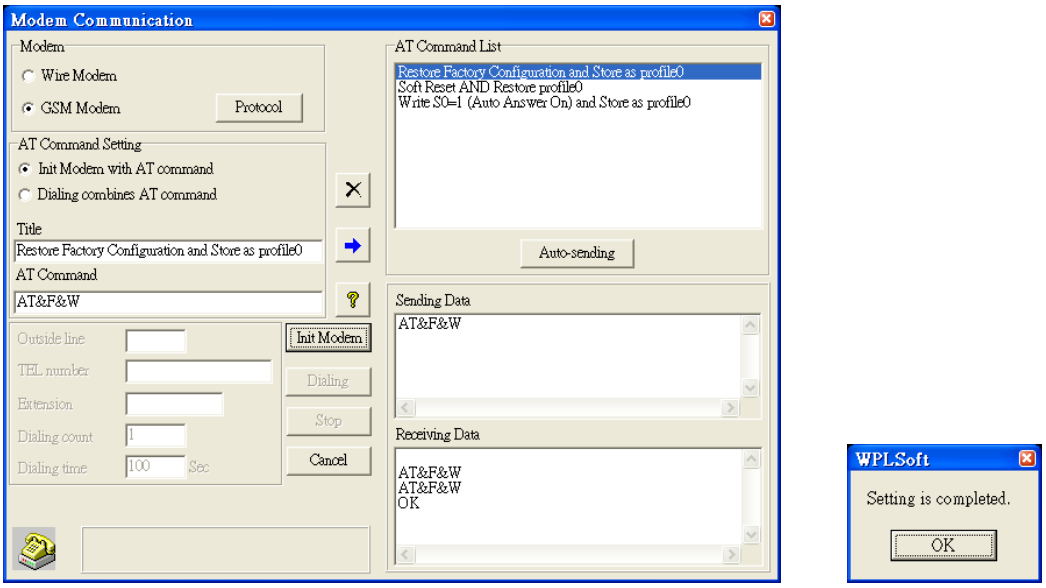
Step 5: In “MODEM Communication” dialog box, there are 3 built-in AT instruction as follows for MODEM initial process.

1. Restore Factory Configuration and Store as profile0 (AT&F&W)
2. Soft Reset AND Restore profile0 (ATZ)

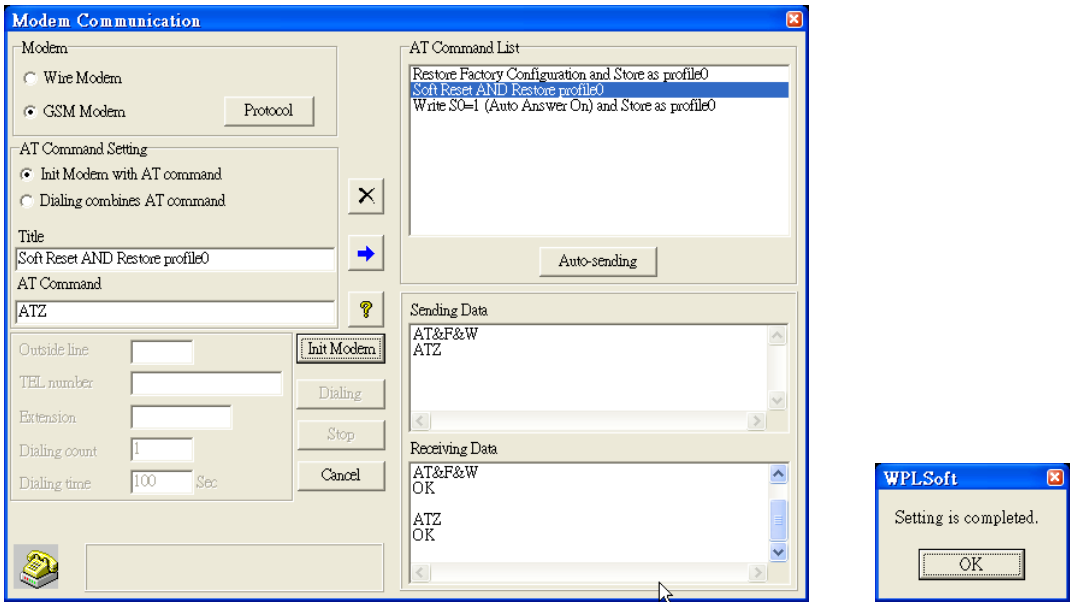
3. Write S0=1 (Auto Answer On) and Store as profile0 (ATS0=1&W)



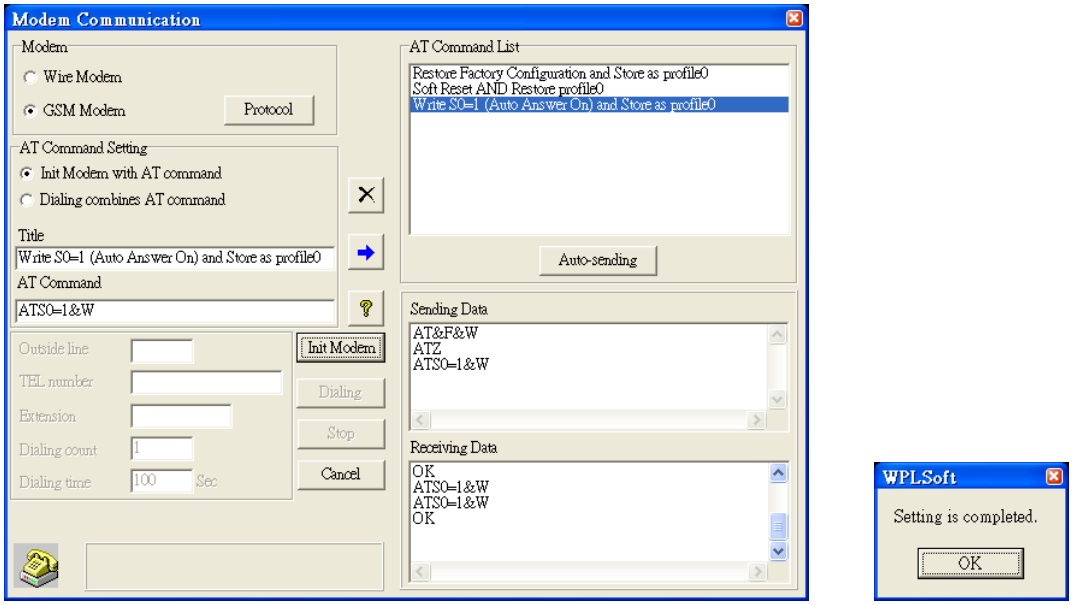
Step 6: The initial AT instruction is AT&F&W0 (Restore Factory Configuration and Store as profile0) and transmit AT instruction by "Send". Also, it is available to set "Sending Data" and "Receiving Data". After these setting success, WPLSoft will display "Setting is completed".



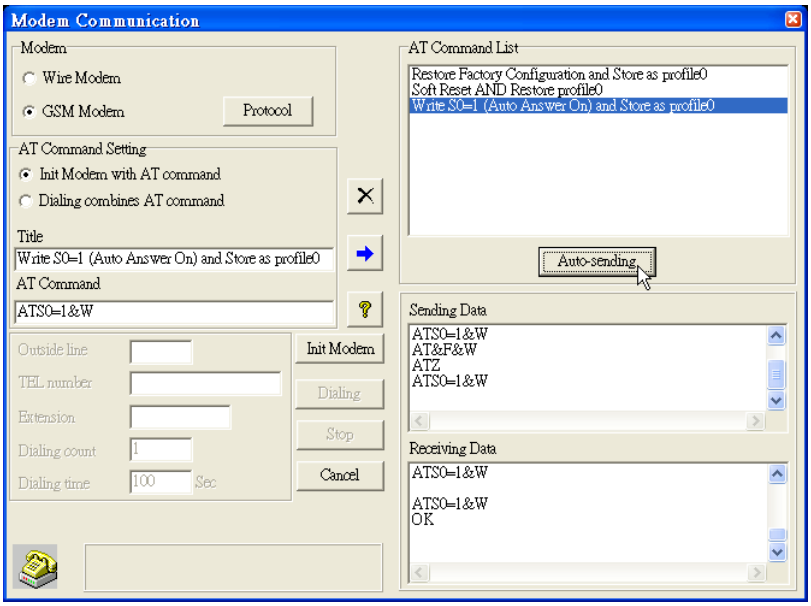
Step 7: ATZ (Soft Reset and Restore profile0). "Setting is completed will show up once AT instruction setting is done.



Step 8: ATS0=1&W0 (Write S0=1 for Auto Answer ON and Store as Profile0. If write S0=0, Auto Answer will OFF). Setting is completed will show up once AT instruction setting is done.



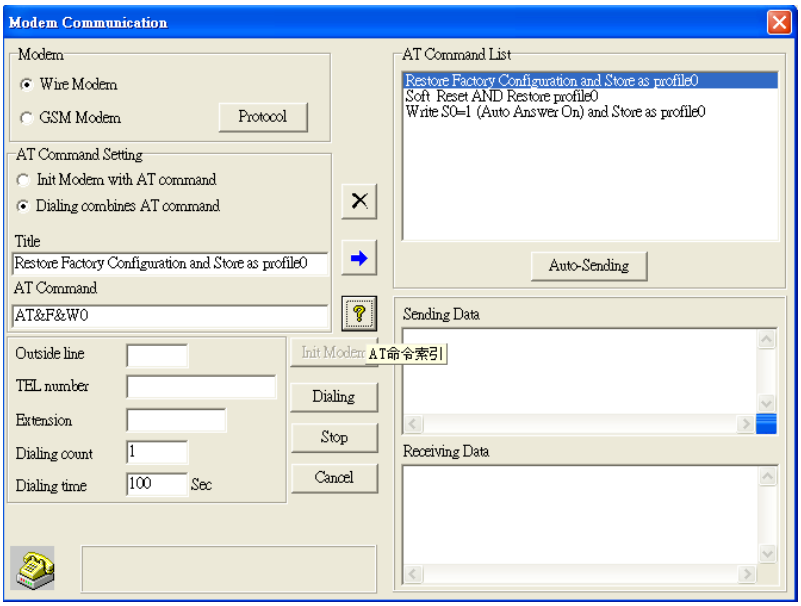
Step 9: click “Auto-sending” to send AT instructions in order via WPLSoft program. “Setting is completed” will show up when AT instructions setting via WPLSoft is done.

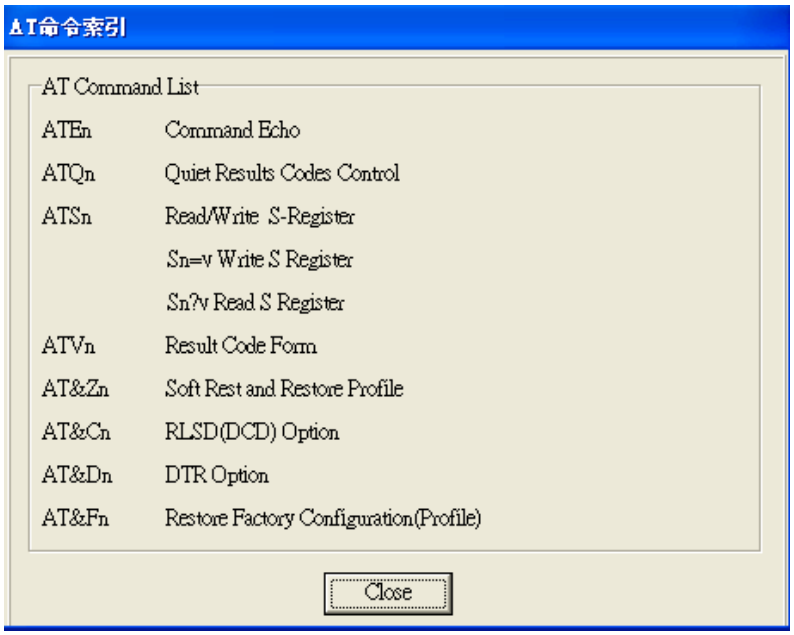


Step 10: the AA led of 56K MODEM will be lit after setting and it will remain ON at next time power on that means MODEM initial completion. Some MODEM or GSM MODEM doesn't have AA led, but the function is the same.

***Important Information:**

1. For more information about AT instructions, please refer to MODEM user manual.
2. For MODEM communication, please click "Help of AT command" icon for brief explanation. See illustration as follow:


Modem Communication
Modem
Wire Modem
GSM Modem
Protocol
AT Command Setting
Init Modem with AT command
Dialing combines AT command
Title
Restore Factory Configuration and Store as profile0
AT Command
AT&F&W0
Outside line
TEL number
Extension
Dialing count
1
Dialing time
100
Sec
Init Modem
AT命令索引
Dialing
Stop
Cancel
AT Command List
Restore Factory Configuration and Store as profile0
Soft Reset AND Restore profile0
Write S0=1 (Auto Answer On) and Store as profile0
Auto-Sending
Sending Data
Receiving Data


AT命令索引
AT Command List
ATEn Command Echo
ATQn Quiet Results Codes Control
ATSn Read/Write S-Register
Sn=v Write S Register
Sn?v Read S Register
ATVn Result Code Form
AT&Zn Soft Rest and Restore Profile
AT&Cn RLSD(DCD) Option
AT&Dn DTR Option
AT&Fn Restore Factory Configuration(Profile)
Close

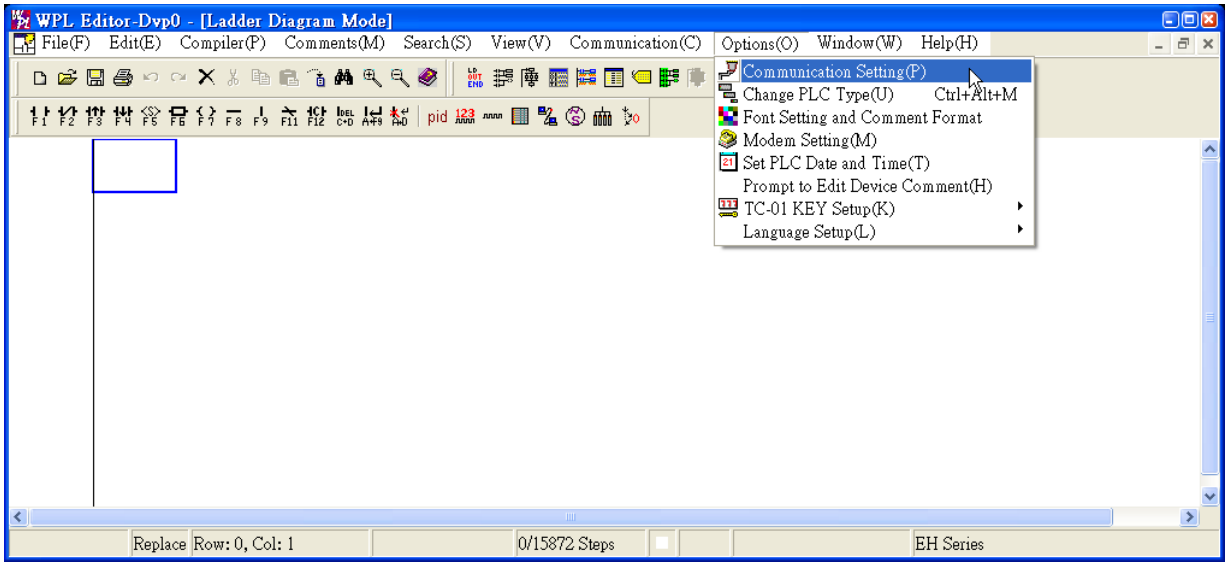
Example 2: The GSM MODEM in PC (Master) site can dial to the GSM MODEM in PLC MPU (Slave) site by using WPLSoft. Once connection is done, PLC MPU can upload program to PC for program modification and PC can download program modified to PLC MPU with monitoring function.

***Important Information:**

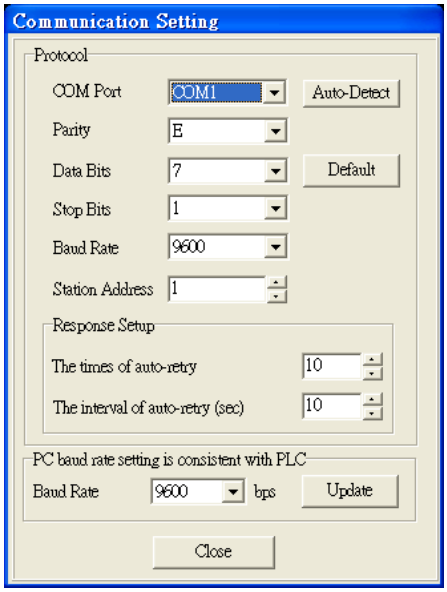
1. The SIM card phone number of the GSM MODEM should be specific number of mobile MODEM (phone number is provided by local telecom carrier)

2. The format of GSM MODEM communication port connected to PLC MPU is ASCII 9600, 8, N, 1. (COM1 setting: D1036, M1138; COM2 setting: D1120, M1120)

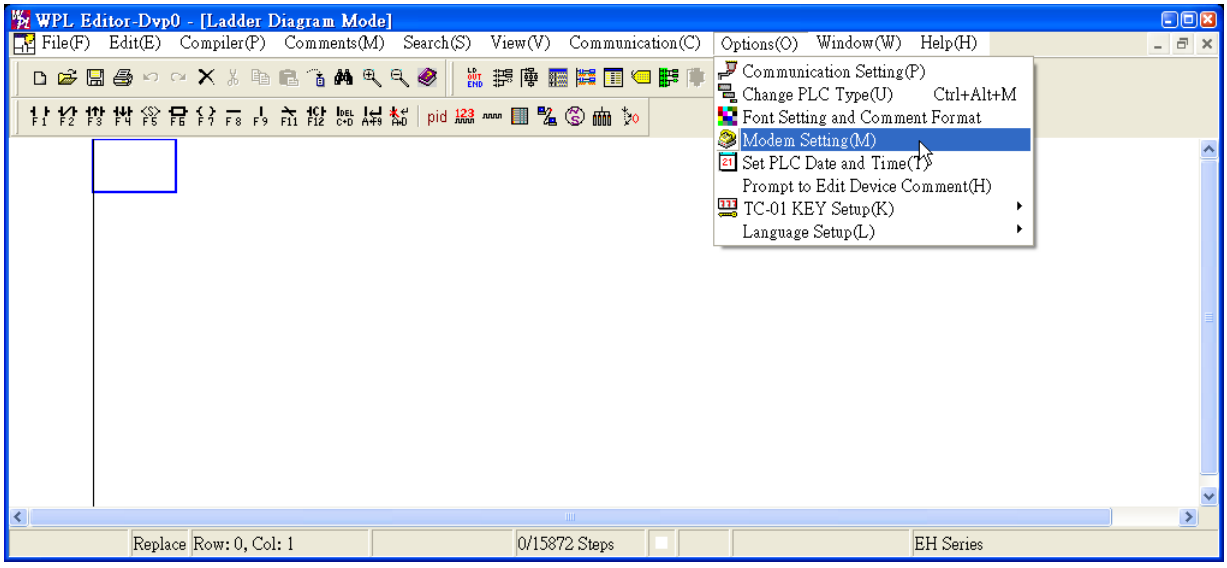
Step1: Use WPLSoft to select "Option"→"Communication Setting (P)" to set communication port that is connected with MODEM.



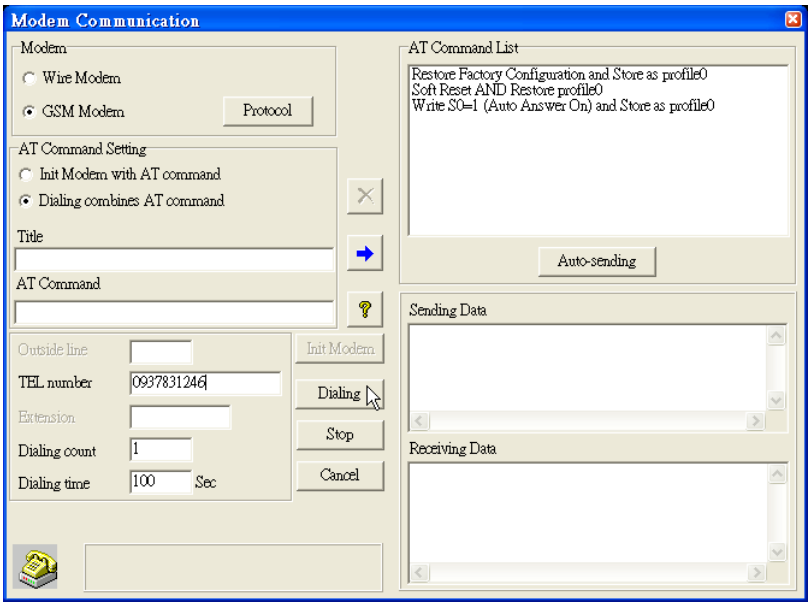
Step 2: Set communication baud rate 9600, which is fixed without modification flexibility. For example, set the communication port of MODEM as COM1 (decided by the PC port that MODEM exactly connect to), “Baud Rate” as 9600, “Station Address” as 1, “Response Setup” for both “The time of auto-retry” & “The interval of auto-retry (sec)” as 10 and finally click “OK” to finish communication setting. If communication quality is bad, please increase the value of “The time of auto-retry” & “The interval of auto-retry (sec)” to improve quality problem. (See illustration as follow). WPLSoft will send instructions according to communication setting.



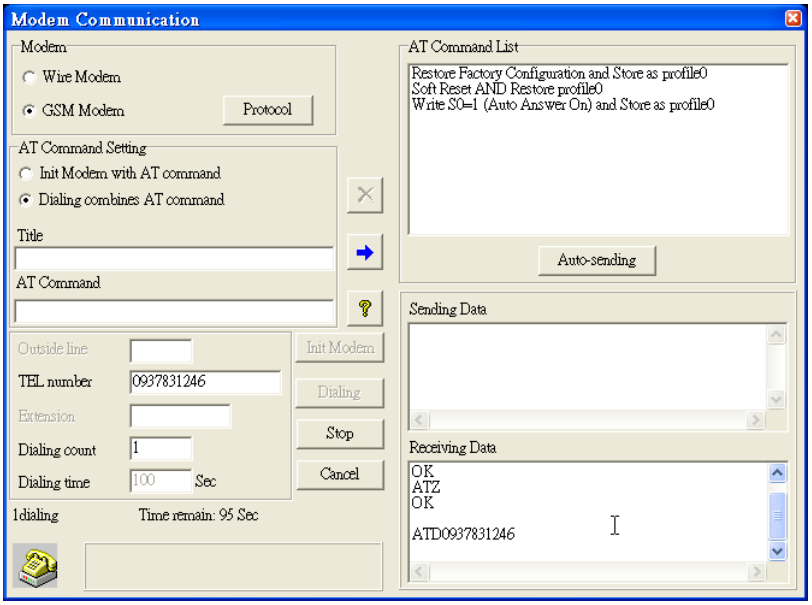
Step 3: select “Option (O)”→ select “MODEM Setting (M)” to dial connection, see illustration as follow:


WPL Editor-Dvp0 - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Communication Setting(P)
Change PLC Type(U) Ctrl+Alt+M
Font Setting and Comment Format
Modem Setting(M)
Set PLC Date and Time(T)
Prompt to Edit Device Comment(H)
TC-01 KEY Setup(K)
Language Setup(L)
Replace Row: 0, Col: 1
0/15872 Steps
EH Series

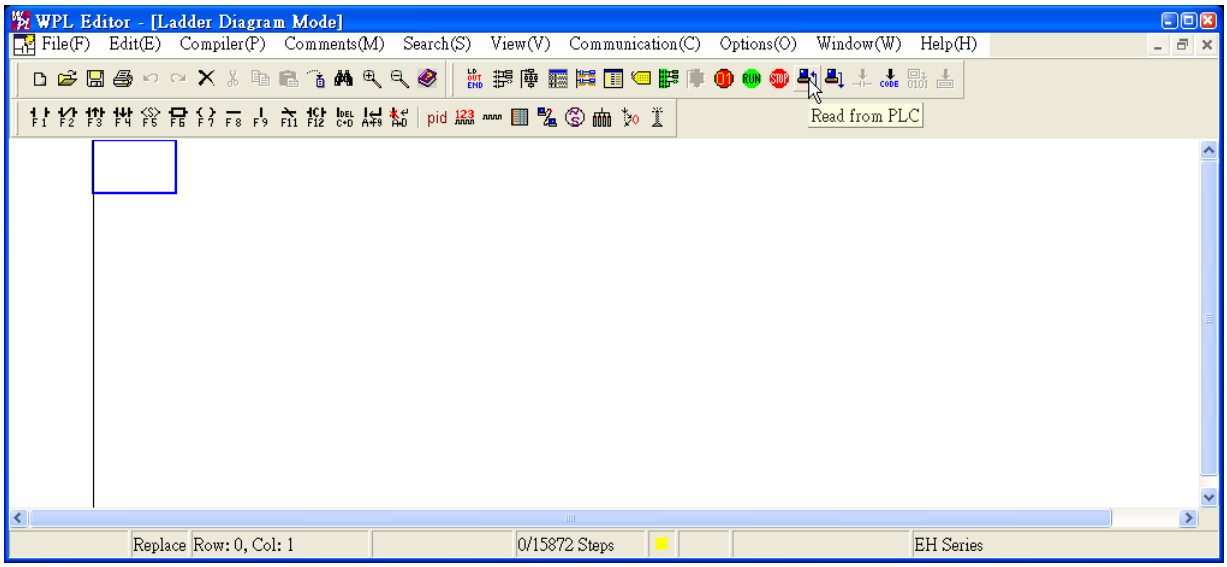
Step 4: When “MODEM Communication” dialogue box shows up, please choose GSM MODEM and select AT instruction that is set to dial phone number. Key in the phone number of the SIM card of the GSM MODEM in Slave site and click “dialing” to proceed connection. (See illustration down left side). For example: the phone number of the SIM card in GSM MODEM is 0937831246, please fill in 0937831246 in “TEL number” for dialing.



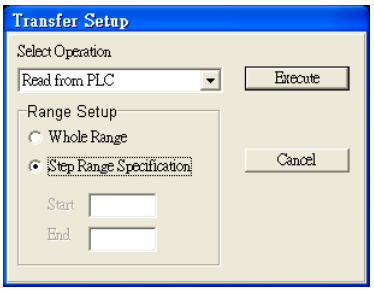
Step 5: Once completing dialing, a dialogue box “MODEM is connecting successful” will show up and click “OK”.



Step 6: click the icon “Read from PLC” to download program from PLC.

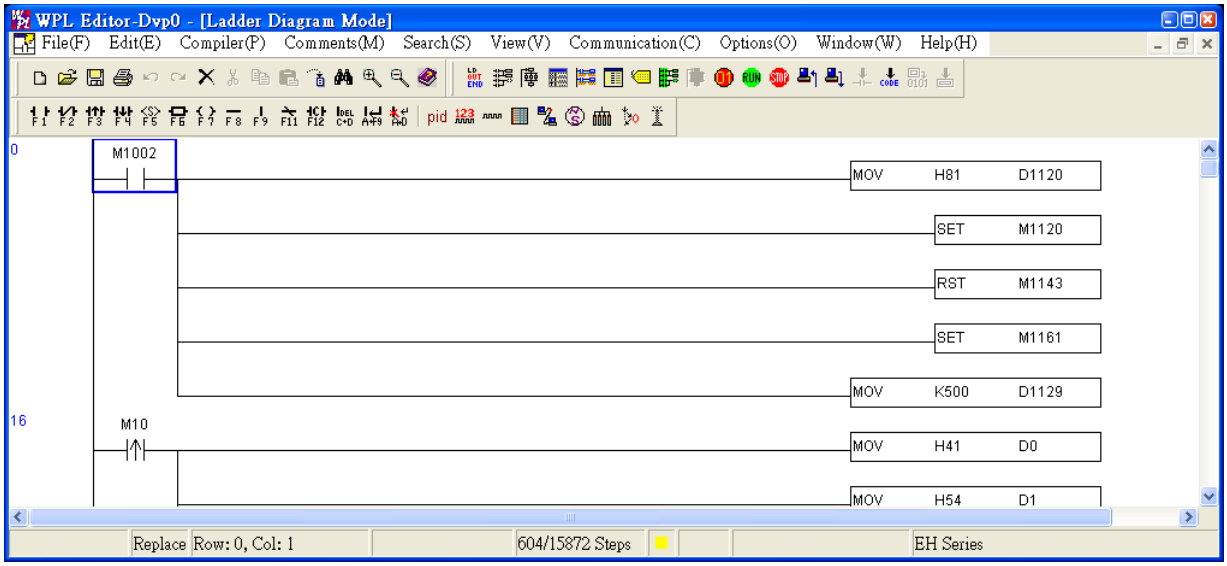

WPL Editor - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Read from PLC
Replace Row: 0, Col: 1
0/15872 Steps
EH Series

Step 7: select either “Whole Rang” or “Step Range Specification” to download program, and finally click “Execute”.

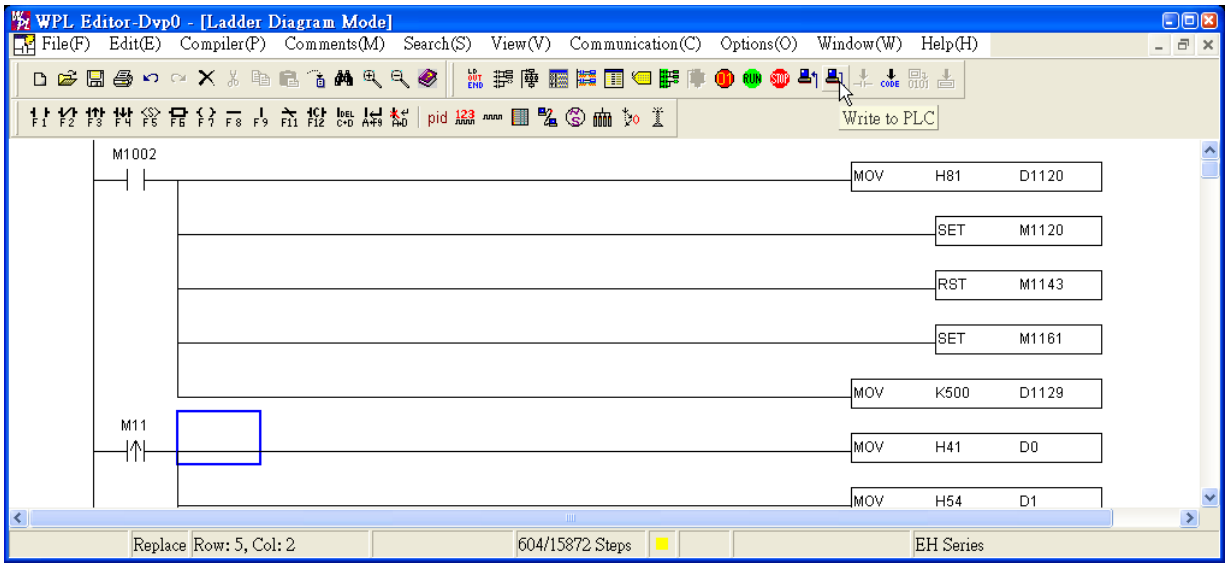


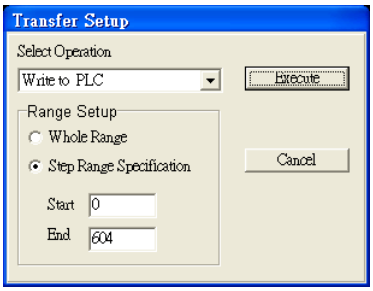
Step 8: “Read from PLC” dialog box will show on the screen and click “OK” when communication is finished.

Step 9: The ladder diagram window of remote PLC will show up.

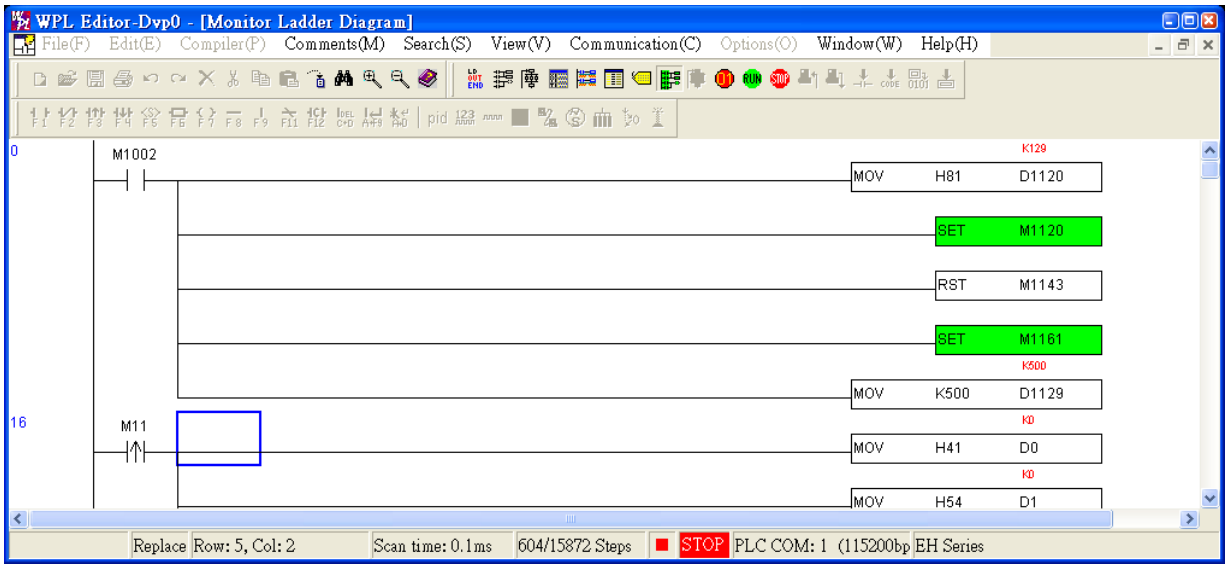


Step 10: Finishing program modification in WPLSoft ladder diagram window, clike the icon “Write to PLC” to upload modified program to remote PLC MPU.

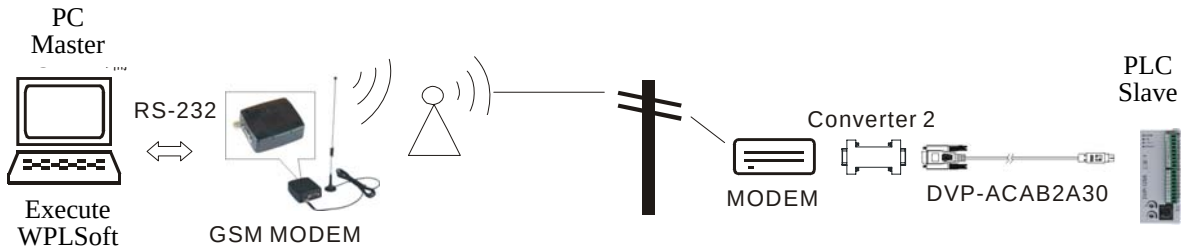




Step 11: Monitor Ladder Diagram



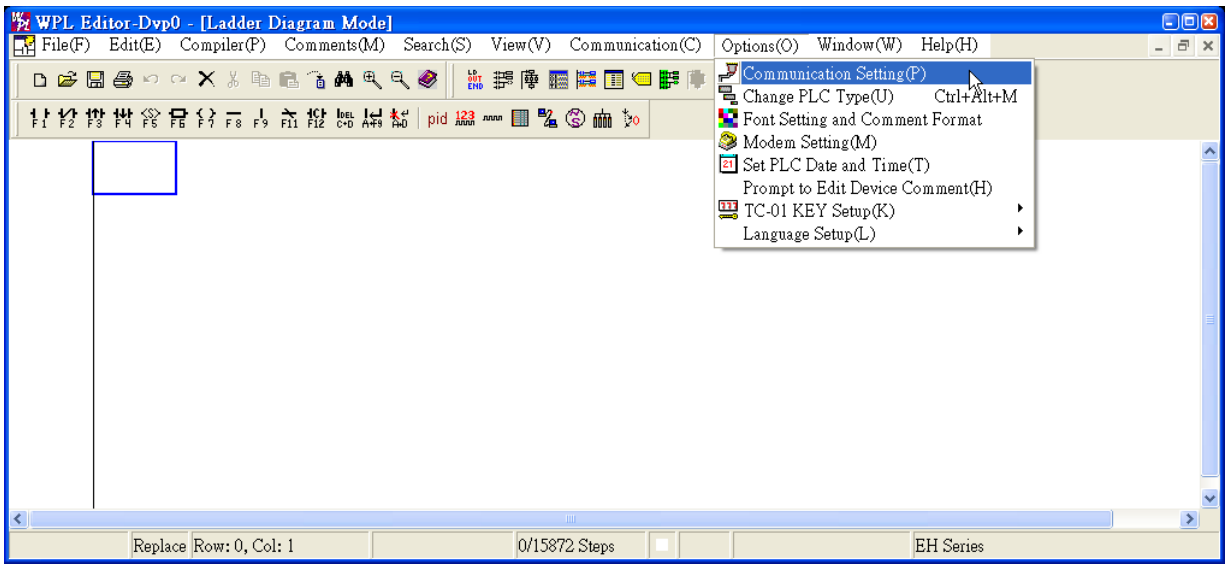
Example 3: The GSM MODEM in PC (Master) site can dial to the 56K MODEM in PLC MPU (Slave) site by using WPLSoft. Once connection is done, PLC MPU can upload program to PC for program modification and PC can download program modified to PLC MPU with monitoring function.



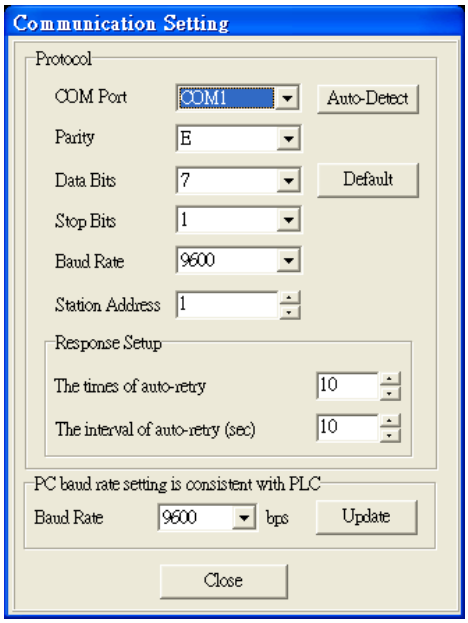
***Important Information:**

1. The SIM card phone number of the GSM MODEM should be specific number of mobile MODEM (phone number is provided by local telecom carrier)
2. The phone number of 56K MODEM can't be an extension number.
3. The format of GSM MODEM communication port used to connect to PLC MPU is ASCII9600, 8, N, 1. (COM1 setting: D1036, M1138; COM2 setting: D1120, M1120)

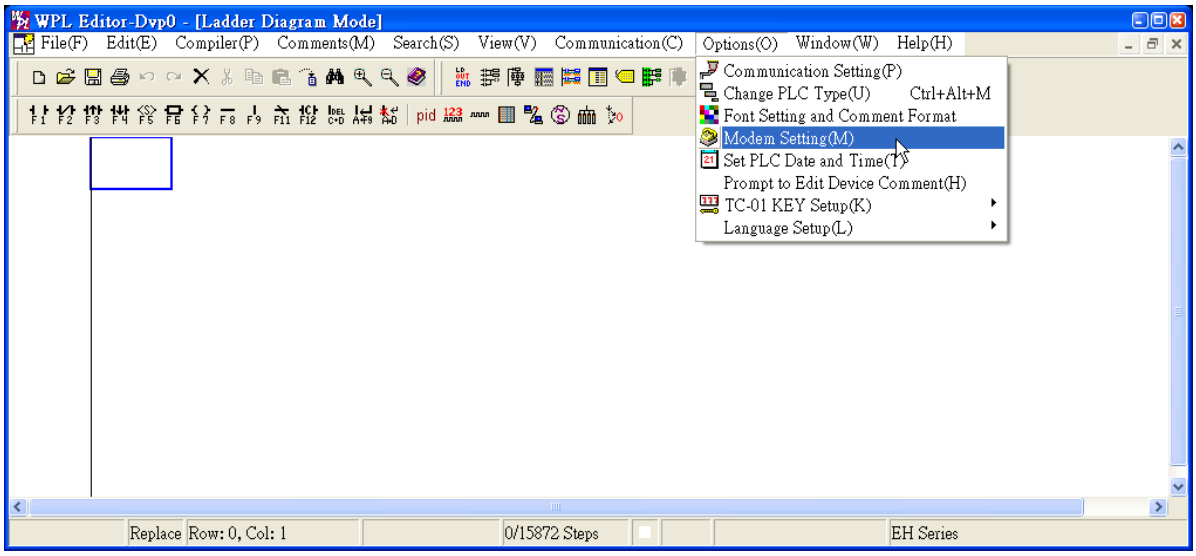
Step1: Use WPLSoft to select "Option"→"Communication Setting (P)" to set communication port that is connected with MODEM.


WPL Editor-Dvp0 - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Communication Setting(P)
Change PLC Type(U) Ctrl+Alt+M
Font Setting and Comment Format
Modem Setting(M)
Set PLC Date and Time(T)
Prompt to Edit Device Comment(H)
TC-01 KEY Setup(K)
Language Setup(L)
Replace Row: 0, Col: 1
0/15872 Steps
EH Series

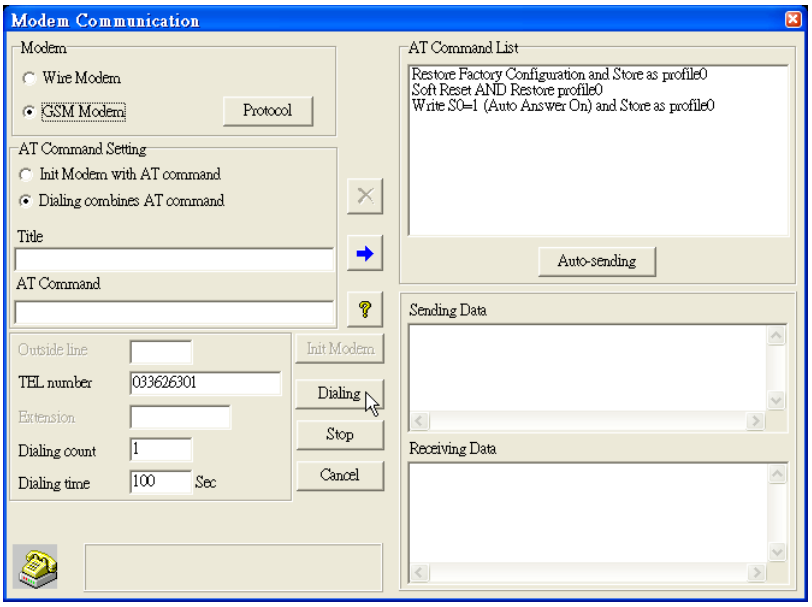
Step 2: Set communication baud rate 9600, which is fixed without modification flexibility. For example, set the communication port of MODEM as COM1 (decided by the PC port that MODEM exactly connect to), “Baud Rate” as 9600, “Station Address” as 1, “Response Setup” for both “The time of auto-retry” & “The interval of auto-retry (sec)” as 10 and finally click “OK” to finish communication setting. If communication quality is bad, please increase the value of “The time of auto-retry” & “The interval of auto-retry (sec)” to improve quality problem. (See illustration as follow). WPLSoft will send instructions according to communication setting.



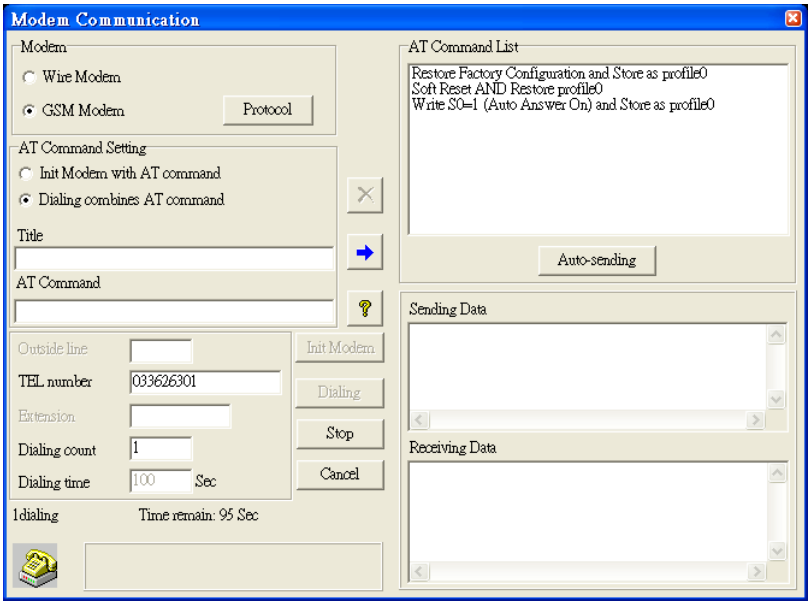
Step 3: select “Option (O)”→ select “MODEM Setting (M)” to dial connection, see illustration as follow:



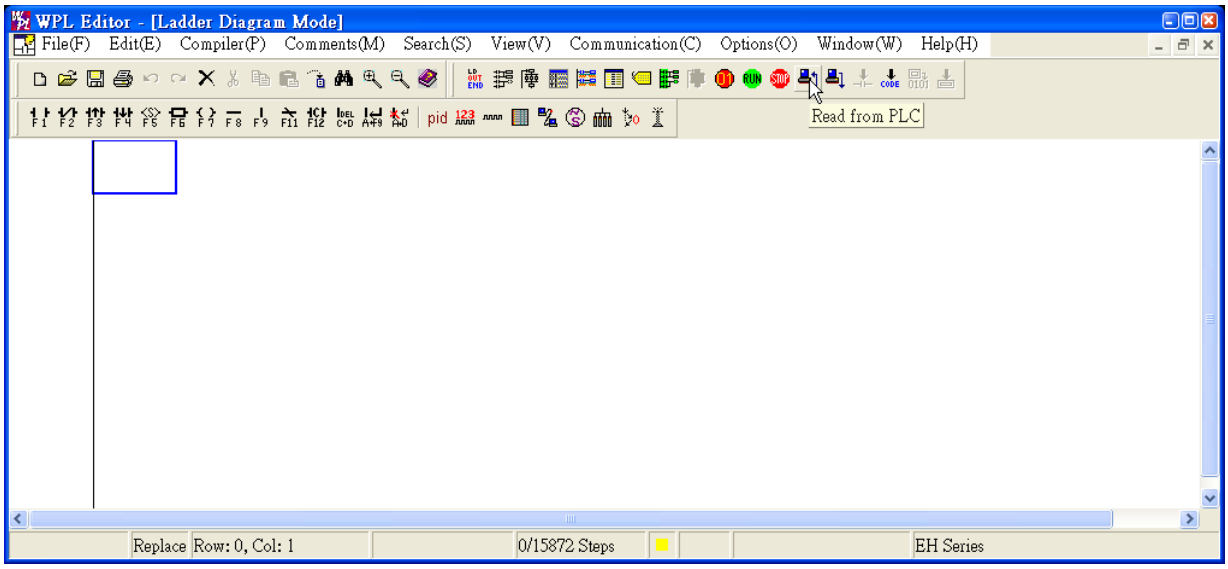
Step 4: When “MODEM Communication” dialogue box shows up, please choose GSM MODEM and select AT instruction that is set to dial phone number. Key in the phone number of the GSM MODEM in Slave site and click “dialing” to proceed connection. (See illustration down left side). For example: the phone number of the GSM MODEM is 033626301, please fill in 033626301 in “TEL number” for dialing.



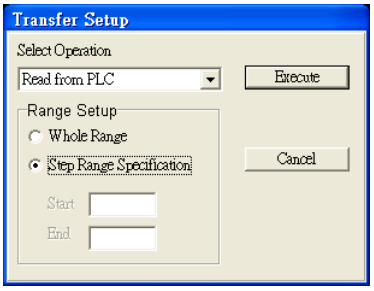
Step 5: Once completing dialing, a dialogue box “MODEM is connecting successful” will show up and click “OK”.



Step 6: click the icon “Read from PLC” to download program from PLC.

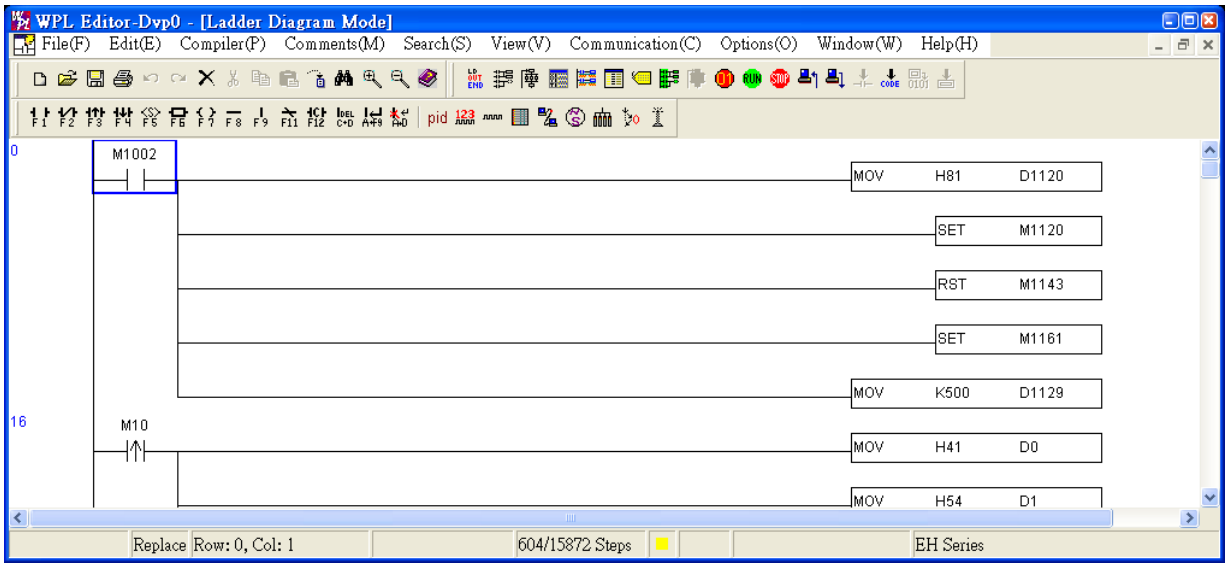

WPL Editor - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Read from PLC
Replace Row: 0, Col: 1
0/15872 Steps
EH Series

Step 7: select either “Whole Rang” or “Step Range Specification” to download program, and finally click “Execute”.

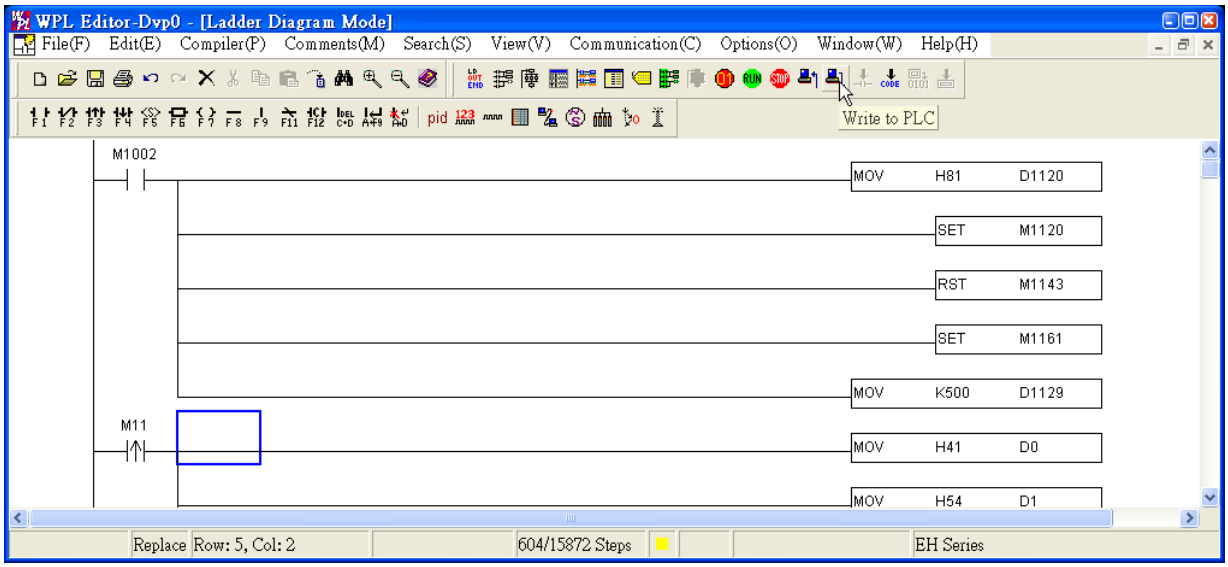


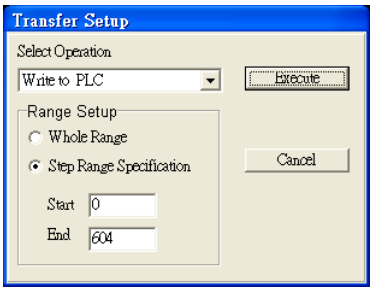
Step 8: “Read from PLC” dialog box will show on the screen and click “OK” when communication is finished.

Step 9: The ladder diagram window of remote PLC will show up.

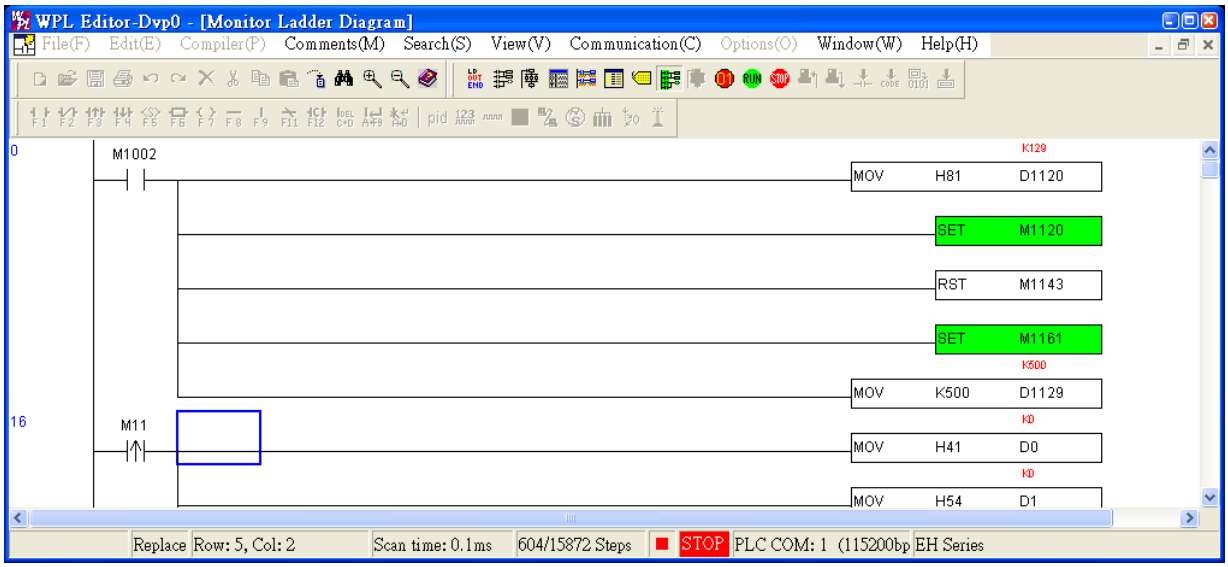


Step 10: Finishing program modification in WPLSoft ladder diagram window, click the icon “Write to PLC” to upload modified program to remote PLC MPU.

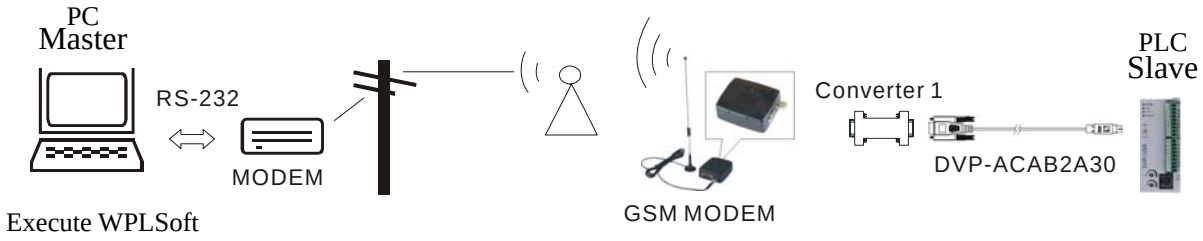




Step 11: Monitor Ladder Diagram



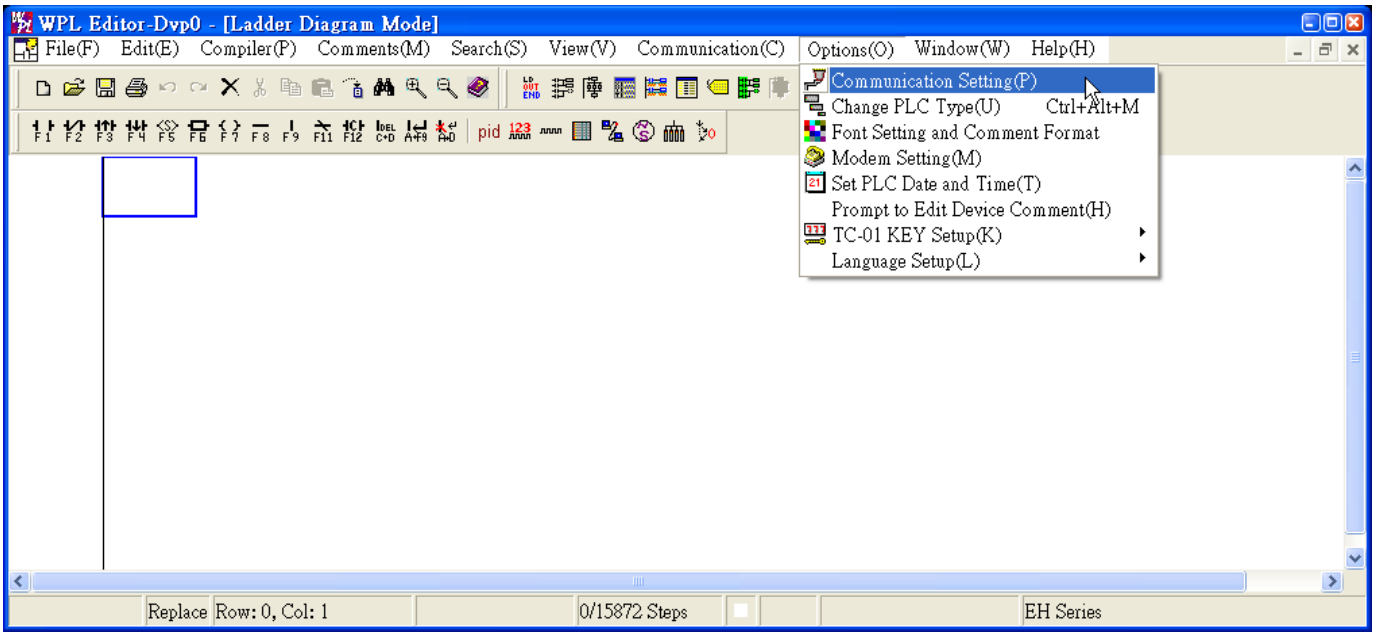
Example 4: The 56K MODEM in PC (Master) site can dial to the GSM MODEM in PLC MPU (Slave) site by using WPLSoft. Once connection is done, PLC MPU can upload program to PC for program modification and PC can download program modified to PLC MPU with monitoring function.



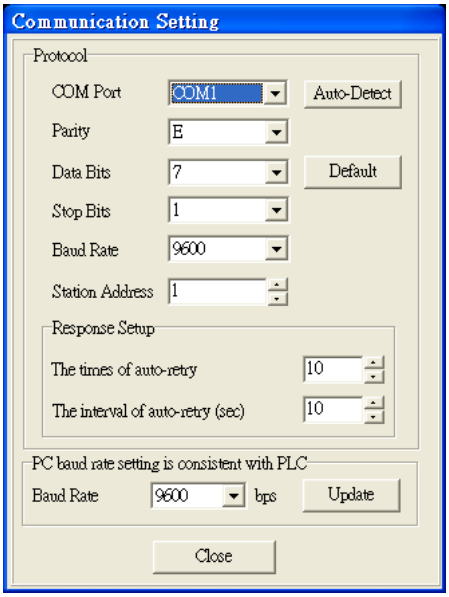
***Important Information:**

1. The SIM card phone number of the GSM MODEM should be specific number of mobile MODEM (phone number is provided by local telecom carrier)
2. The format of GSM MODEM communication port used to connect to PLC MPU is ASCII9600, 8, N, 1. (COM1 setting: D1036, M1138; COM2 setting: D1120, M1120)

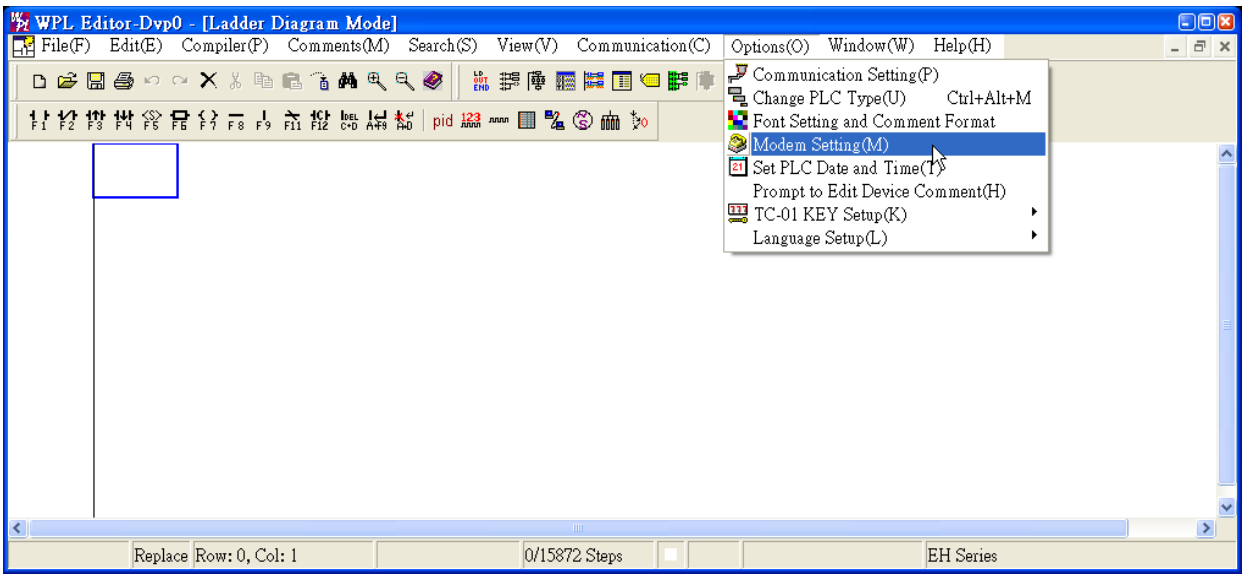
Step1: Use WPLSoft to select "Option"→"Communication Setting (P)" to set communication port that is connected with MODEM.



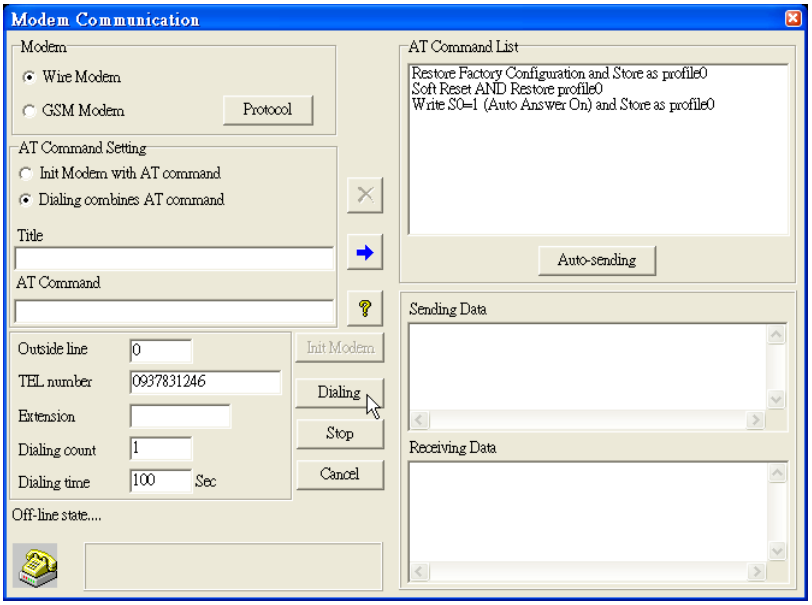
Step 2: Set communication baud rate 9600, which is fixed without modification flexibility. For example, set the communication port of MODEM as COM1 (decided by the PC port that MODEM exactly connect to), “Baud Rate” as 9600, “Station Address” as 1, “Response Setup” for both “The time of auto-retry” & “The interval of auto-retry (sec)” as 10 and finally click “OK” to finish communication setting. If communication quality is bad, please increase the value of “The time of auto-retry” & “The interval of auto-retry (sec)” to improve quality problem. (See illustration as follow). WPLSoft will send instructions according to communication setting.



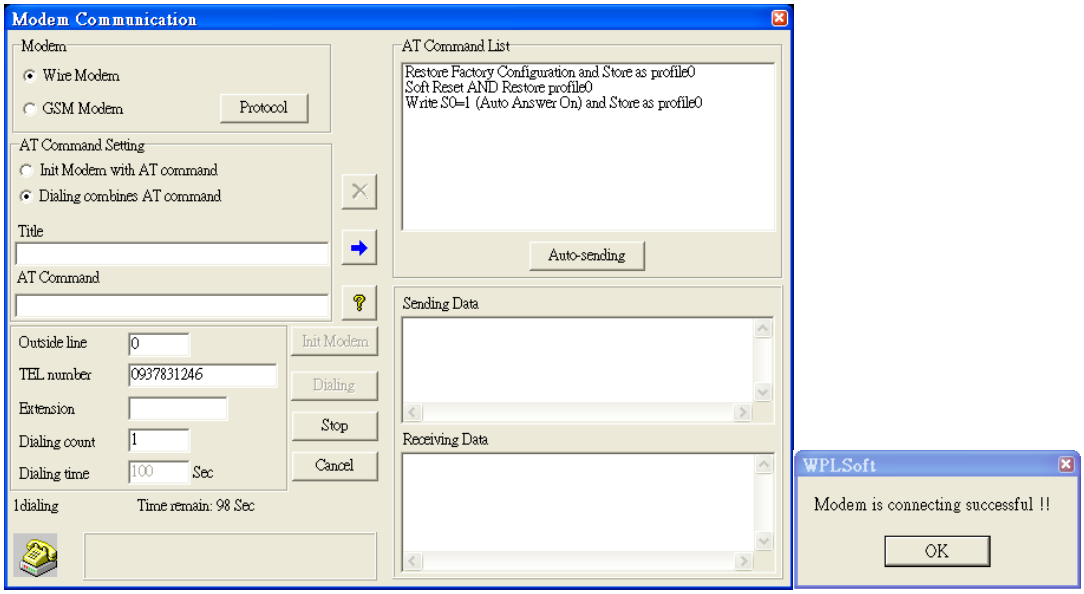
Step 3: select “Option (O)”→ select “MODEM Setting (M)” to dial connection, see illustration as follow:



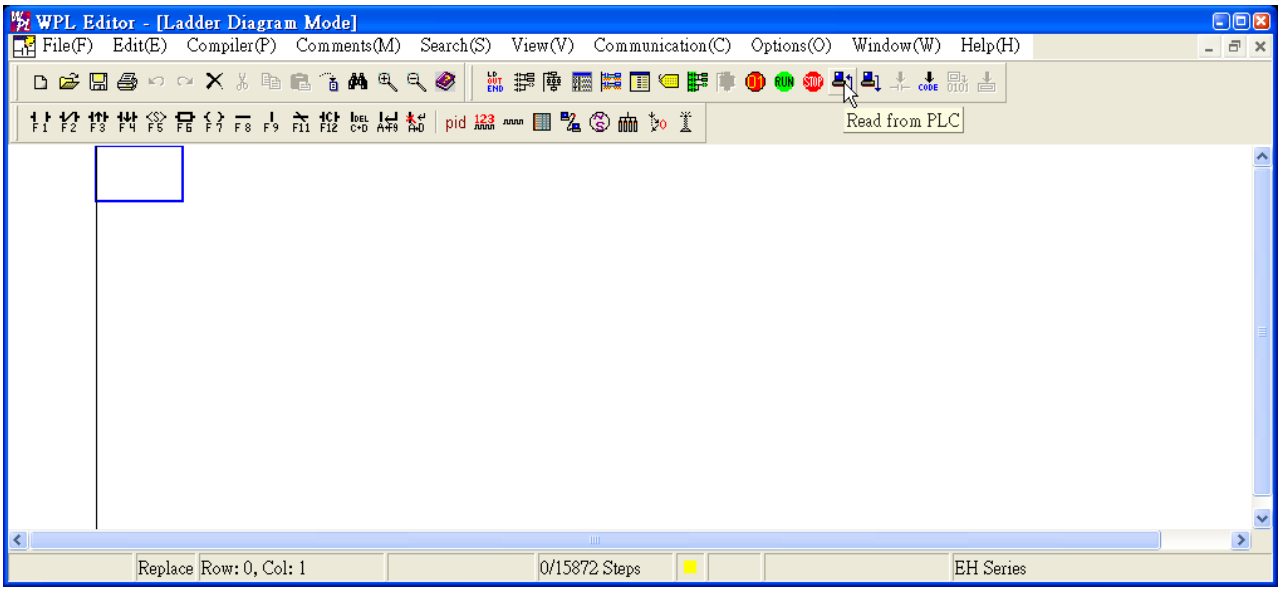
Step 4: When “MODEM Communication” dialogue box shows up, please choose GSM MODEM and select AT instruction that is set to dial phone number. Key in “Outside line” number with “0” and “TEL number” with the phone number of the SIM card of GSM MODEM in Slave site. Finally, click “dialing” to proceed connection. (See illustration down left side). For example: the outside line in Master site is “0” and the phone number in GSM MODEM (Slave) site is 0937831246, please fill “0” in outside line and “0937831246 “ in TEL number. Finally, click “Dailing.”



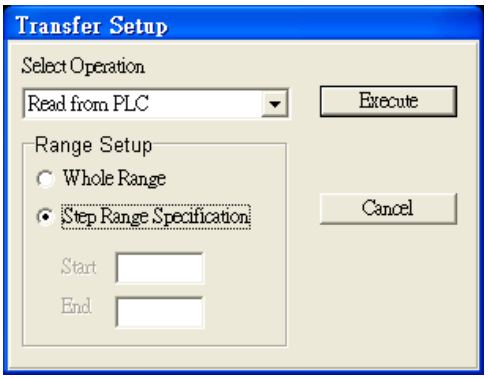
Step 5: Once completing dialing, a dialogue box “MODEM is connecting successful” will show up and click “OK”.



Step 6: click the icon “Read from PLC” to download program from PLC.

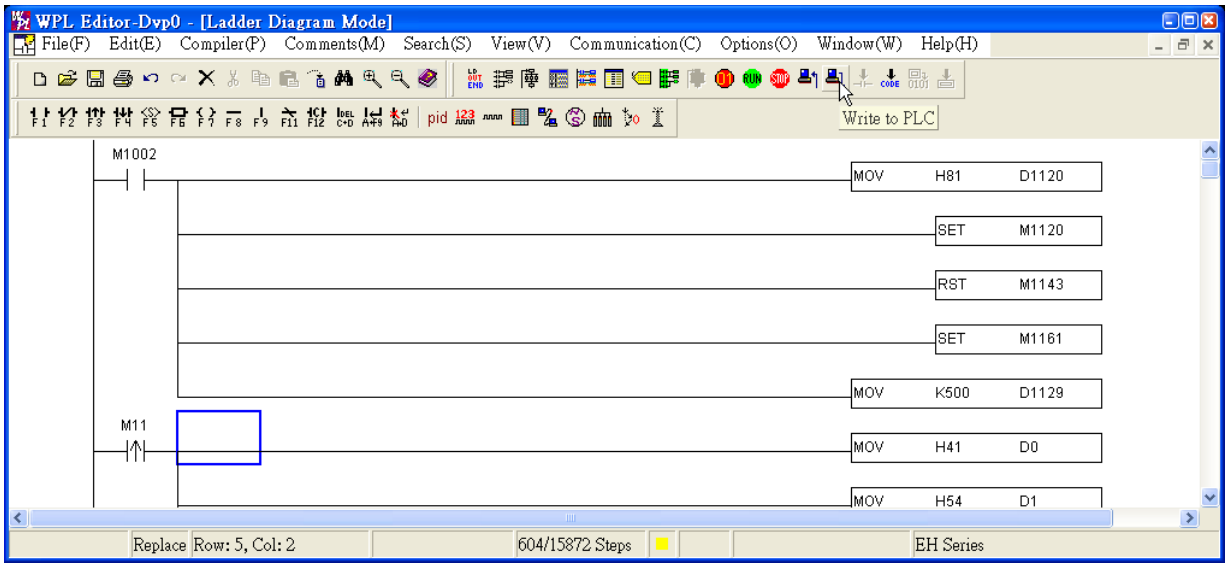

WPL Editor - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
Read from PLC
Replace
Row: 0, Col: 1
0/15872 Steps
EH Series

Step 7: select either “Whole Rang” or “Step Range Specification” to download program, and finally click “Execute”.

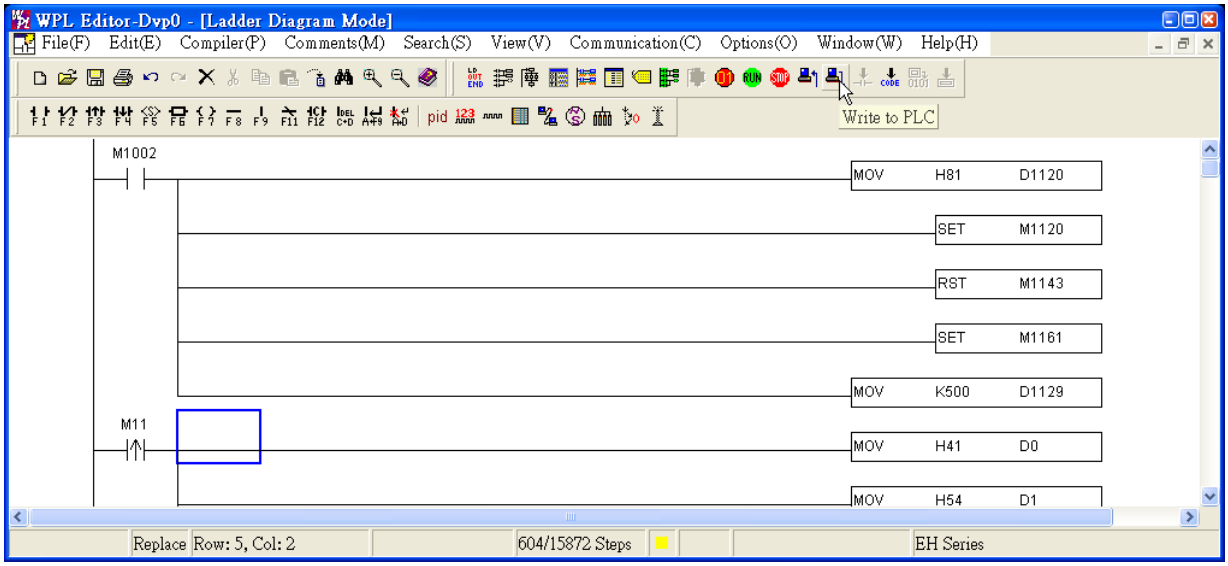


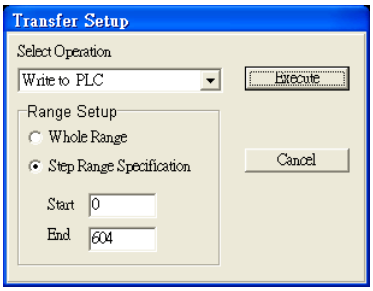
Step 8: “Read from PLC” dialog box will show on the screen and click “OK” when communication is finished.

Step 9: The ladder diagram window of remote PLC will show up.

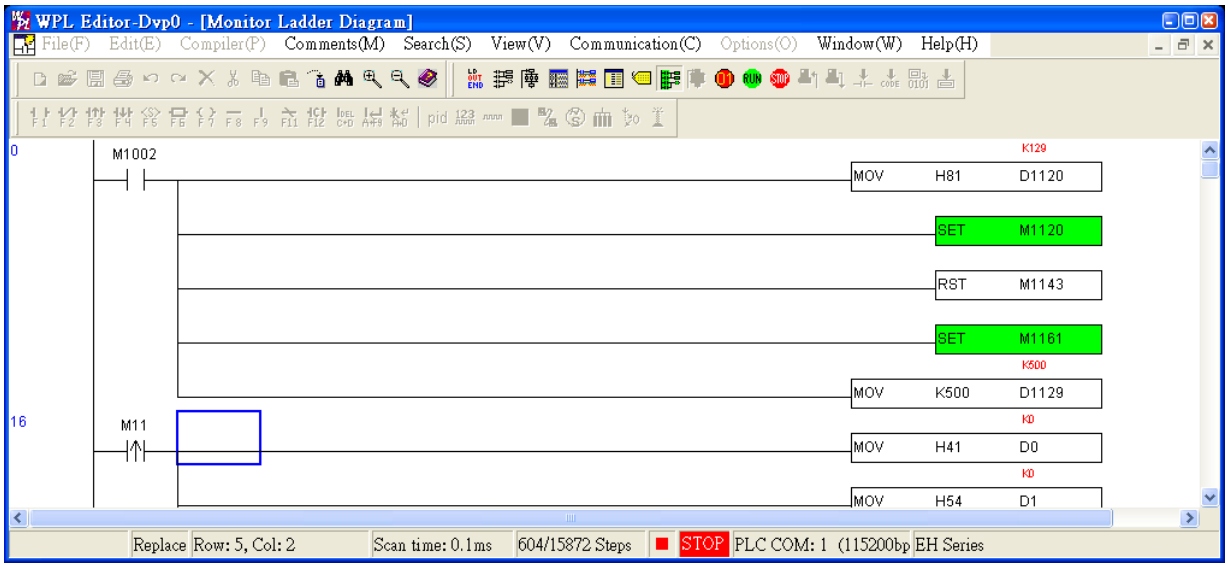


Step 10: Finishing program modification in WPLSoft ladder diagram window, click the icon “Write to PLC” to upload modified program to remote PLC MPU.





Step 11: Monitor Ladder Diagram



※ Notes:

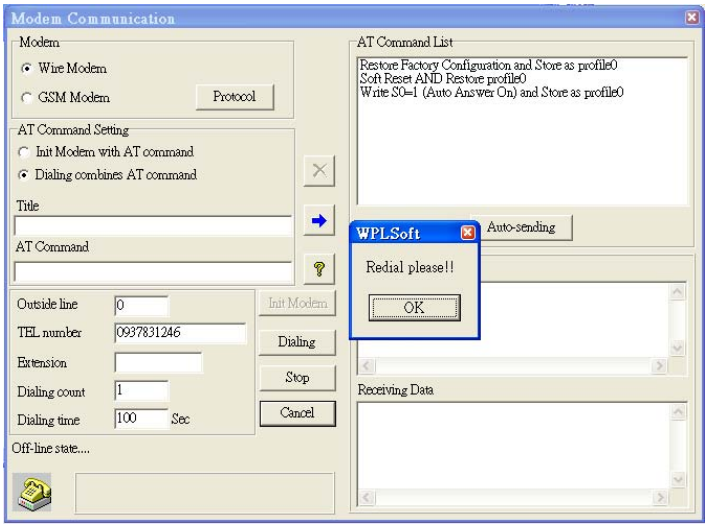
1. After step 5 “MODEM is connecting successful” is done via WPLSoft, the operations of program upload/download or program edit for remote PLC MPU is as same as the operations of PC directly connecting to PLC via cable DVPACAB2A30.
2. After PLC MPU connection successes, sometimes the following dialog box may show up when WPLSoft executes upload, download, or monitor.

Follow-up actions when the above dialog box shows up:

a) Make sure MODEM is properly connected to PLU MPU. Also, check if PLC works normally when power on.

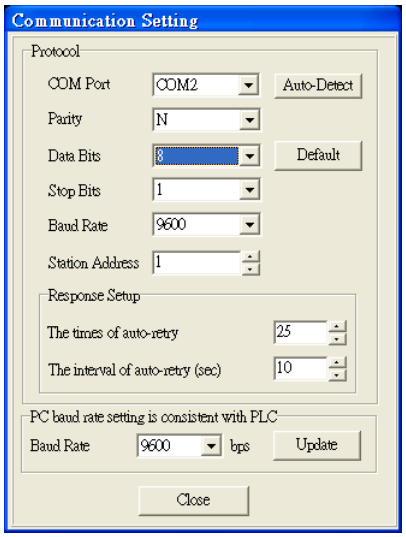
b) Please refer to Example I for re-initial instructions for the MODEM of PLC MPU.

3. When communication quality is bad, the message of ““Redial please!” will show up as following illustration to check again if MODEM connection is normal:

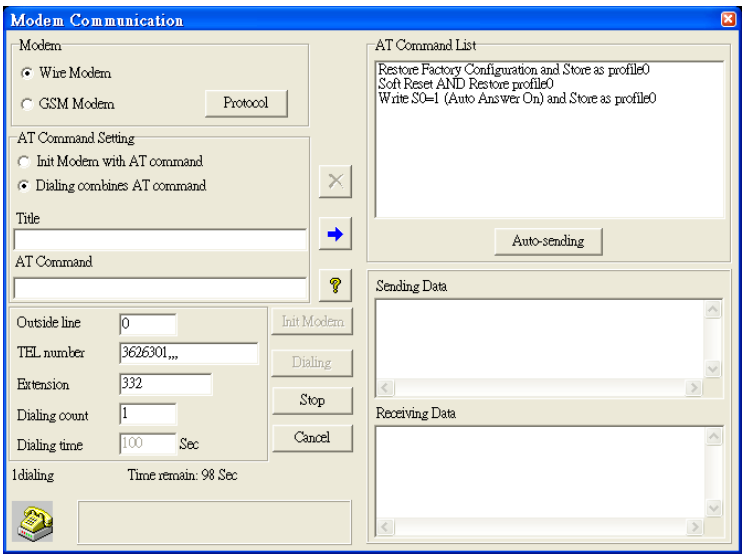


Follow-up action if above dialog box shows up:

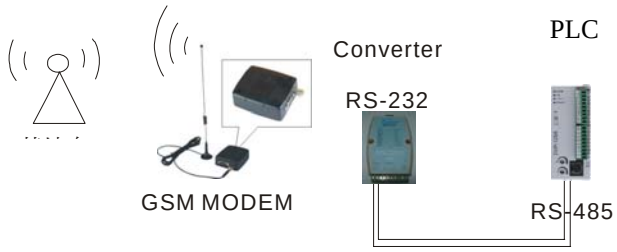
a) Please properly increase the value of “The time of auto-retry” & “The interval of auto-retry (sec)” to improve quality problem. (See illustration as follow)



b) Phone number and extension number can be keyed in “TEL Number” and use comma “ , ” to distinguish the phone and extension number. The more commas the more delay for communication. Please properly use the comma to prevent too much delay from too many commas. (See illustration as follow)



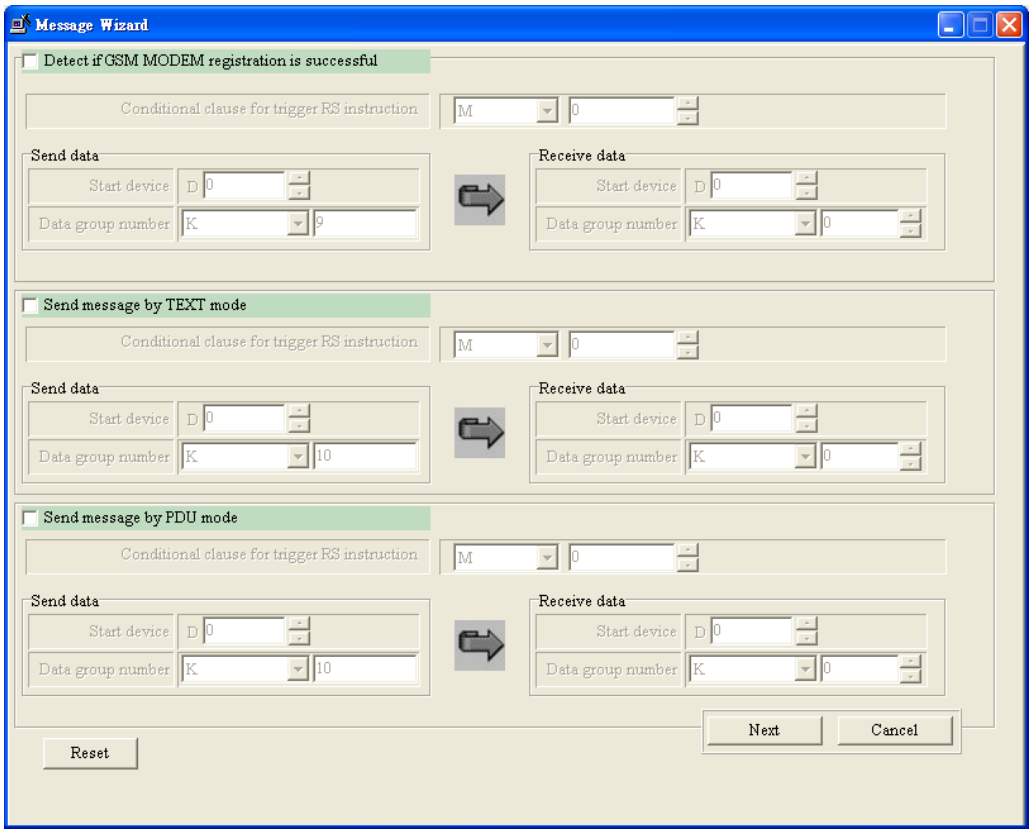
Example 5: Use RS-232-to-RS-485 Converter for GSM MODEM connect to the COM2 (RS-458) of PLC MPU. By using PLC program, set the PLC to send message to owner's cell phone when error happens (Text mode, support ASCII only).



*Important Information:

1. It is very convenient to send or receive short message via Text mode. PDU mode can be applied to support both Chinese and English message. There are three formats for PDU mode to send or receive message: 7-bit, 8-bit, and UCS2. 7-bit is for ASCII word, 8-bit for sending message, and UCS2 for sending Unicode word.
2. The SIM card of GSM MODEM should have SMS function supported by local telecom carrier.
3. The format of GSM MODEM communication port connected to PLC MPU should be ASCII 9600, 8, N, 1. (COM1 setting: D1036, M1138; COM2 setting: D1120, M1120)

Step 1: design a program in PLC of sending SMS message to owner's cell phone when error happens. New version WPLSoft provides message wizard for program design.

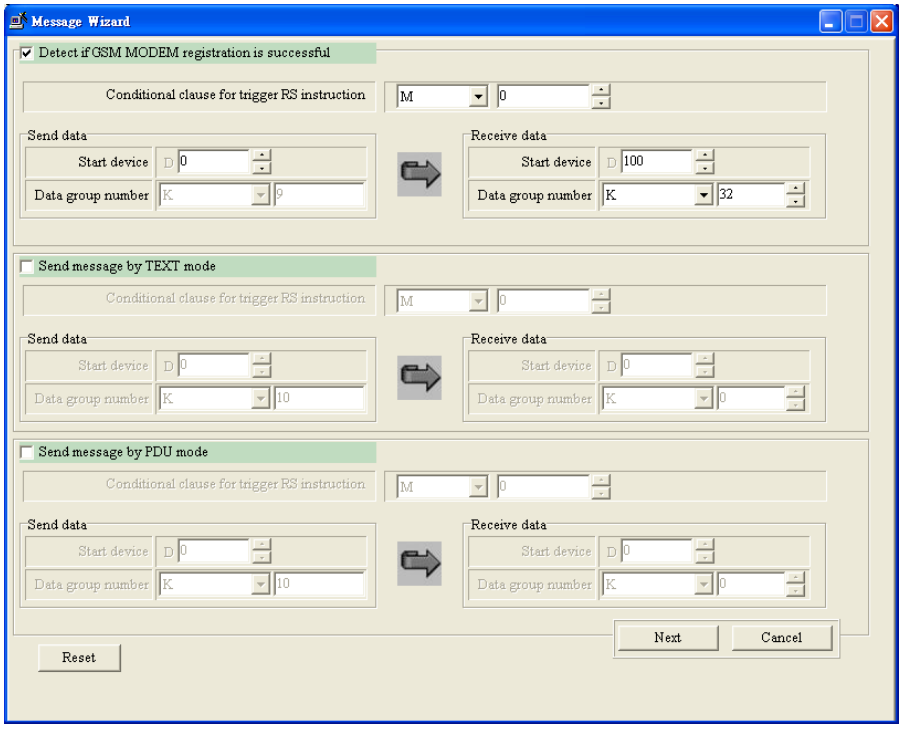


Step 2: Message wizard will automatically generate communication format 9600, 8, N, 1 (ASCII, 8-bit). Example Program is as below:

Step 3: Message wizard will detect if GSM MODEM registration is successful.

Message Wizard:

1. Tick “Detect if GSM MODEM registration is successful”
2. Conditional clause for trigger RS instruction: M0
3. Indicated start device number for sending data: D0. Data group number: 9
4. Indicated start device number for receive data: D100. Data group can be defined by users: K32
5. Wizard message trigger RS instruction to send: “A”(H41), “T”(H54), “+”(H2B), “C”(H43), “R”(H52), “E”(H45), “G”(H47), “?”(H3F), CR(HD), total 9 records. If registration is successful, it will reply “+”, “C”, “R”, “E”, “G”, “:”, “0”, “,”, “1”. Program can check if GSM MODEM is able to send message from return data.

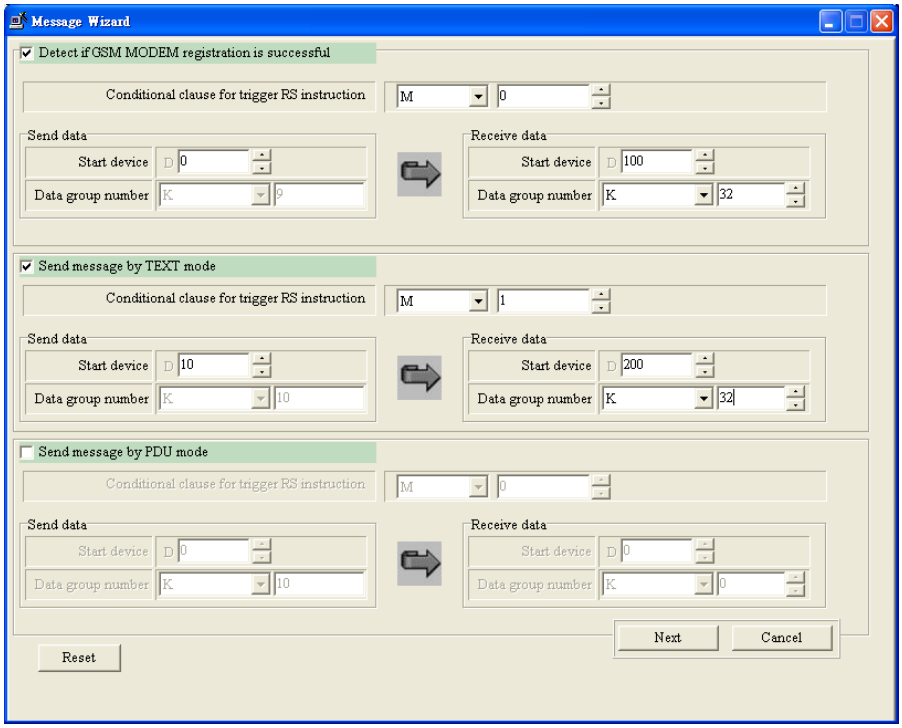


Example Program:

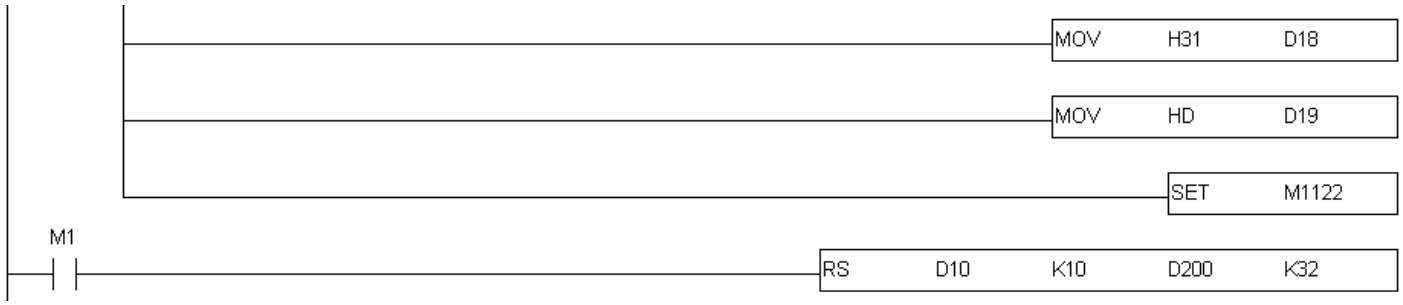
Step 4: It is able to select English message sending in Message Wizard (Text Mode)

Message Wizard:

1. Tick “Send message by TEXT mode” to send English message
2. Conditional clause for trigger RS instruction: M1
3. Indicated start device number of send data: D10. Data group number: 10
4. Indicated start device number for receive data: D200. Data group can be defined by users: K32
5. Wizard message trigger RS instruction to send: “A”(H41), “T”(H54), “+”(H2B), “C”(H43), “M”(H4D), “G”(H47), “F”(H46), “=”(H3D), “1”(H31), CR(HD), total 10 records.



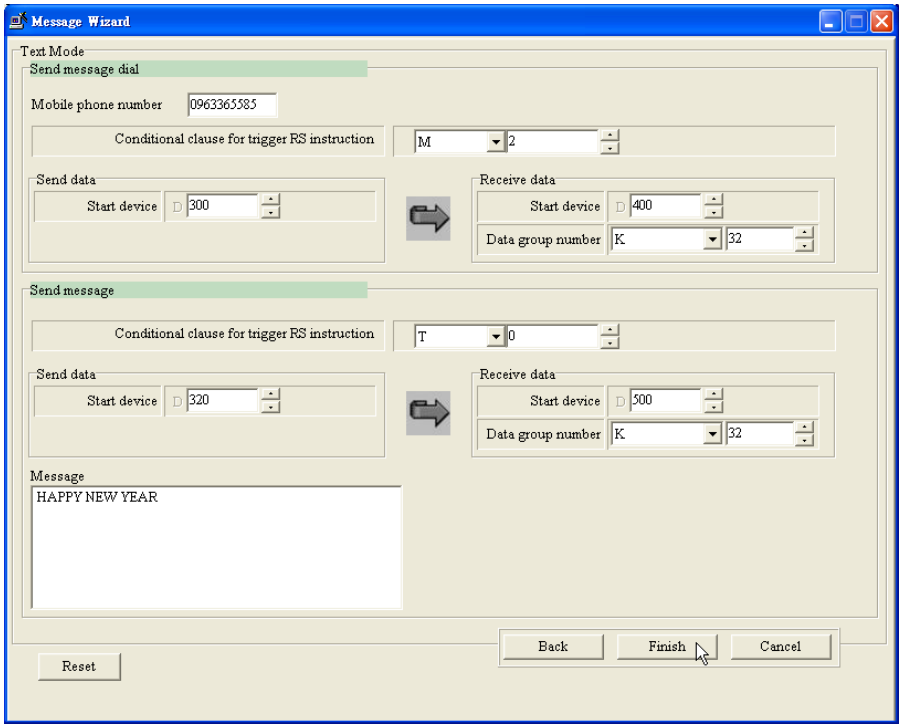
Example Program:



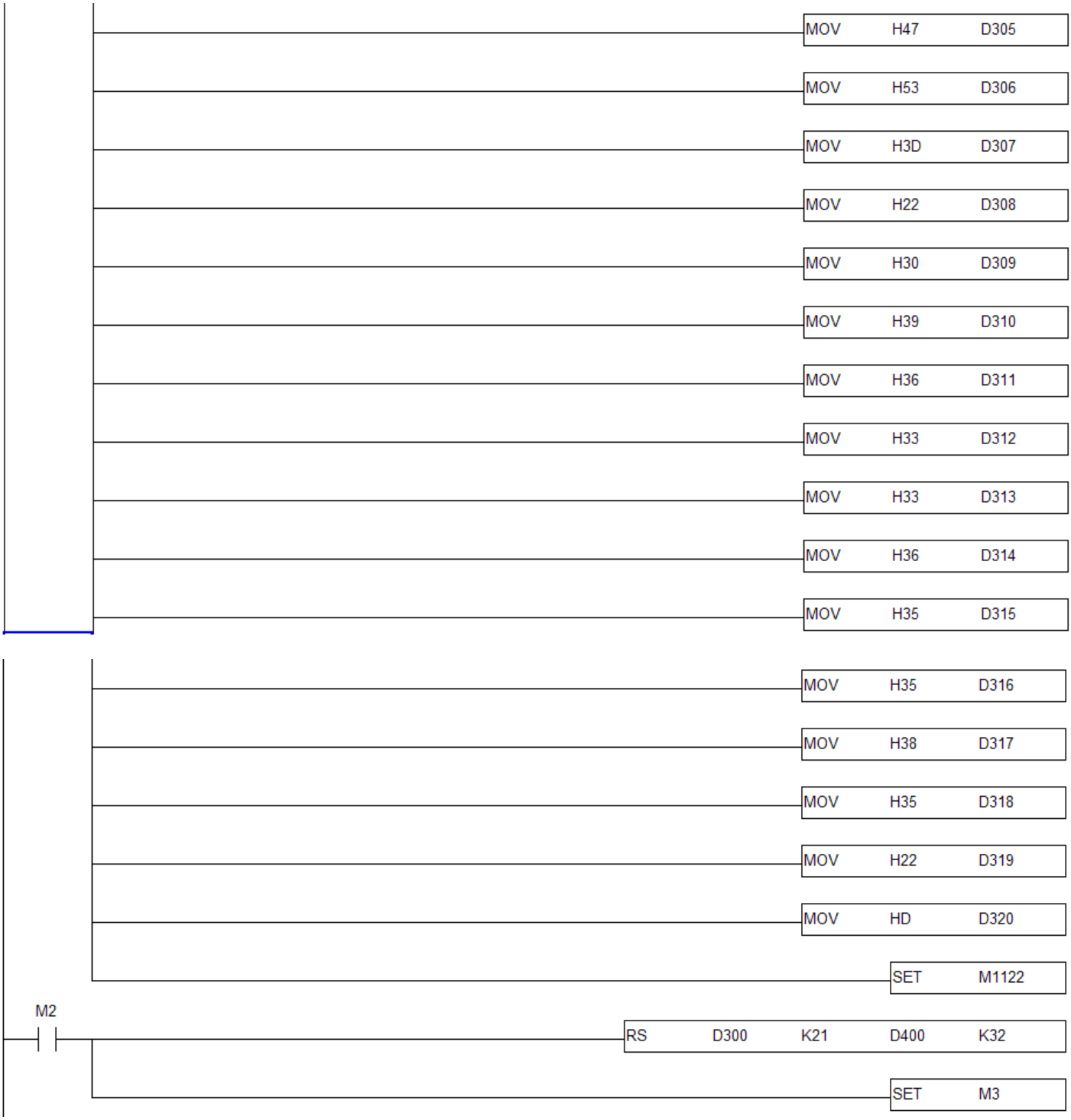
Step 5: click “Next” in Message Wizard to enter English message mode

Message Wizard:

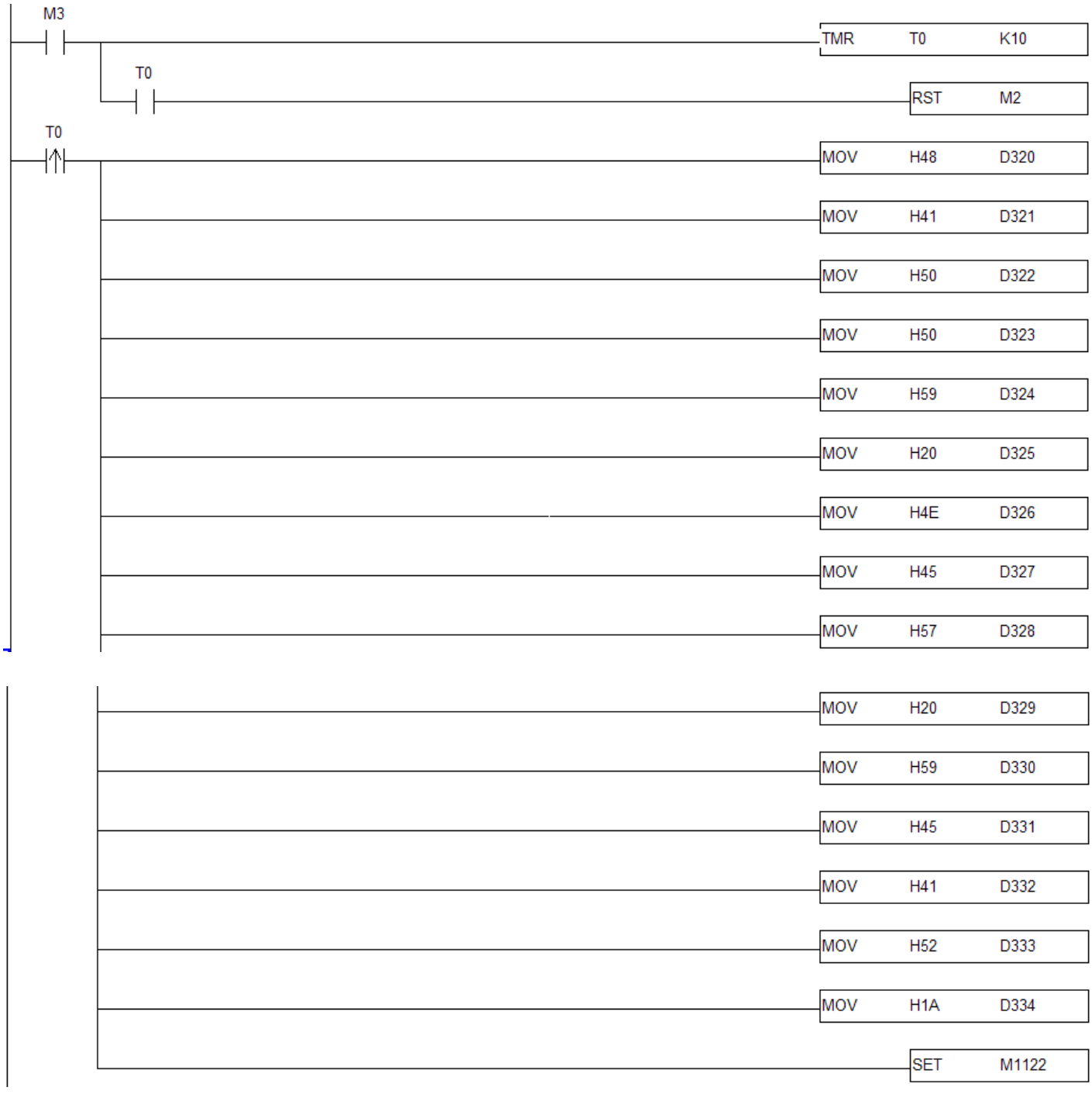
1. Key in the mobile phone number to send message 0963365585, or with international dialing code +886963365585
2. When select Send message dial, additional clause for trigger RS instruction is M2.
3. When select Send message dial, start device number of send date is D300, data group number is decided by the length of mobile phone number.
4. When select Send message dial, start device number of receive date is D400. Data group number can be defined by users: K32
5. When select Send message, Conditional clause for trigger RS instruction is T0. Cooperate to Send message dial and set 1 second delay for data sending.
6. When select Send message, start device number of send data is D320. Data group number is decided by the length of message.
7. When select Send message, start device number of receive data is D500. Data group number is decided by users: K32
8. Key in English message: HAPPY NEW YEAR.
9. Message Wizard will generate RS instruction to proceed message sending via Send message dial (SMS): ”A”(H41),”T”(H54),”+”(H2B),”C” (H43) ”M”(H4D),”G”(H47),”S” (H53),”=”(H3D), ” " ”(H22),”0”(H30),”9”(H39),”6”(H36),”3”(H33),”3”(H33),”6”(H36),”5”(H35),”5”(H35),”8”(H38),”5”(H35), ” " ”(H22),LF(HD)
10. Message Wizard will generate RS instruction to proceed message sending via Send message: ”H”(H48),”A”(H41),”P”(H50),”P”(H50),”Y”(H59),”space”(H20),”N”(H4E),”E”(H45),”W”(H57),”space”(H20),” Y”(H59),”E”(H45),”A”(H41),”R”(H52), LF(HD)
11. Click “Finish”, message wizard will automatically generate program code.

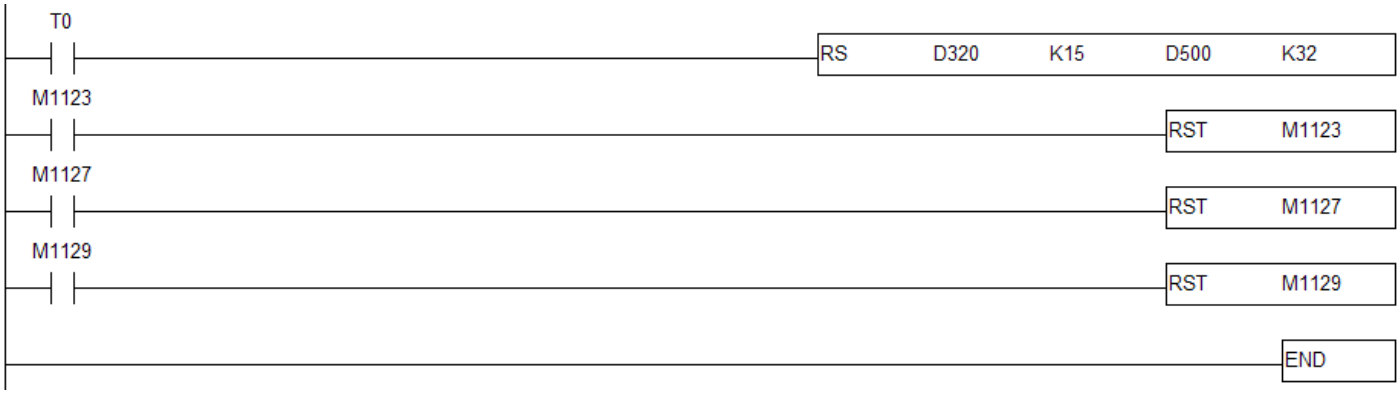


SMS dialing: mobile phone number 0963365585

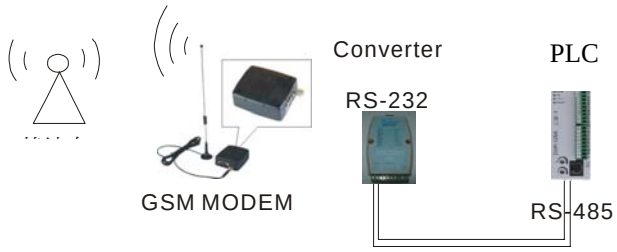


Send message content: HAPPY NEW YEAR


M3
TMR T0 K10
T0
RST M2
T0
MOV H48 D320
MOV H41 D321
MOV H50 D322
MOV H50 D323
MOV H59 D324
MOV H20 D325
MOV H4E D326
MOV H45 D327
MOV H57 D328
MOV H20 D329
MOV H59 D330
MOV H45 D331
MOV H41 D332
MOV H52 D333
MOV H1A D334
SET M1122

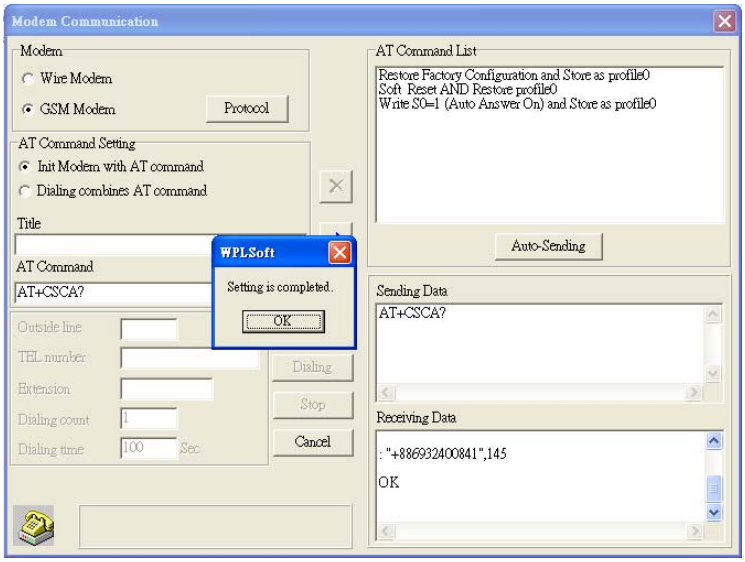

T0
RS D320 K15 D500 K32
M1123
RST M1123
M1127
RST M1127
M1129
RST M1129
END

Example 6: Use RS-232-to-RS-485 Converter for GSM MODEM connect to the COM2 (RS-458) of PLC MPU. By using PLC program, set the PLC to send message to owner's cell phone when error happens.

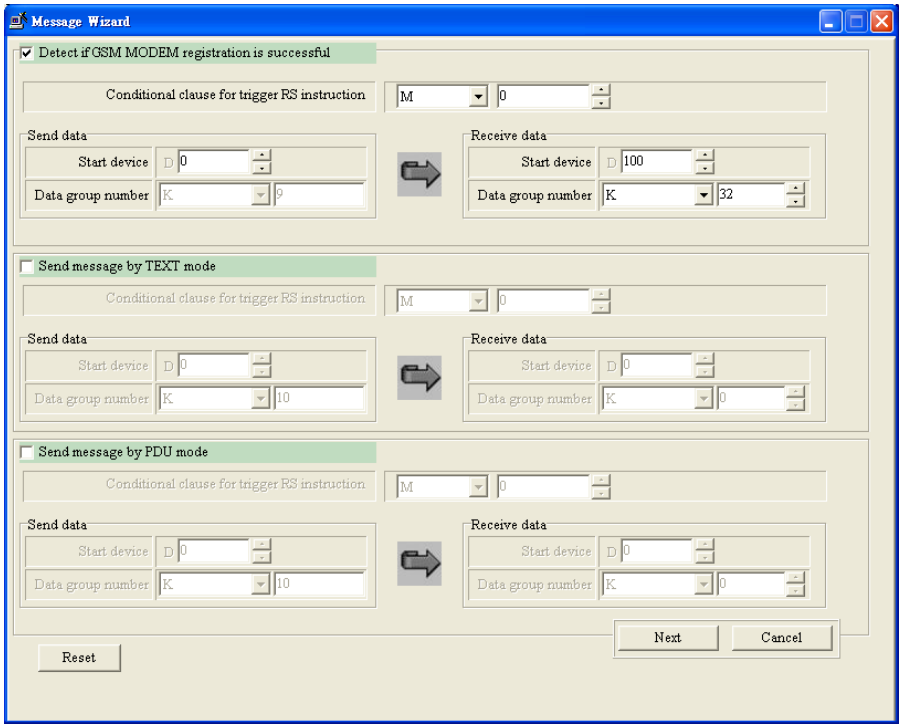


***Important Information:**

1. It is very convenient to send or receive short message via Text mode. PDU mode can be applied to support both Chinese and English message. There are three codes for PDU mode to send or receive message: 7-bit, 8-bit, and UCS2. 7-bit is for ASCII word, 8-bit for sending message, and UCS2 for sending Unicode word. For sending Chinese message, UCS2 should be selected (Unicode).
2. The SIM card of GSM MODEM should have SMS function supported by local telecom carrier.
3. If receiving cell phone doesn't support Unicode, Chinese message won't be displayed by the phone.
4. The format of GSM MODEM communication port connected to PLC MPU should be ASCII 9600, 8, N, 1. (COM1 setting: D1036, M1138; COM2 setting: D1120, M1120)
5. How to get phone number of message service center in system operator?
    1. Contact system operator directly.
    2. By using WPLSoft, set AT instruction via MODEM connection: AT+CSCA?
       GSM MODEM will reply: CSCA: "+886962400841", 145. And then +886962400841 is the phone number of message service center.



Step 1: design a program in PLC of sending SMS message to owner's cell phone when error happens. New version WPLSoft provides message wizard for program design.



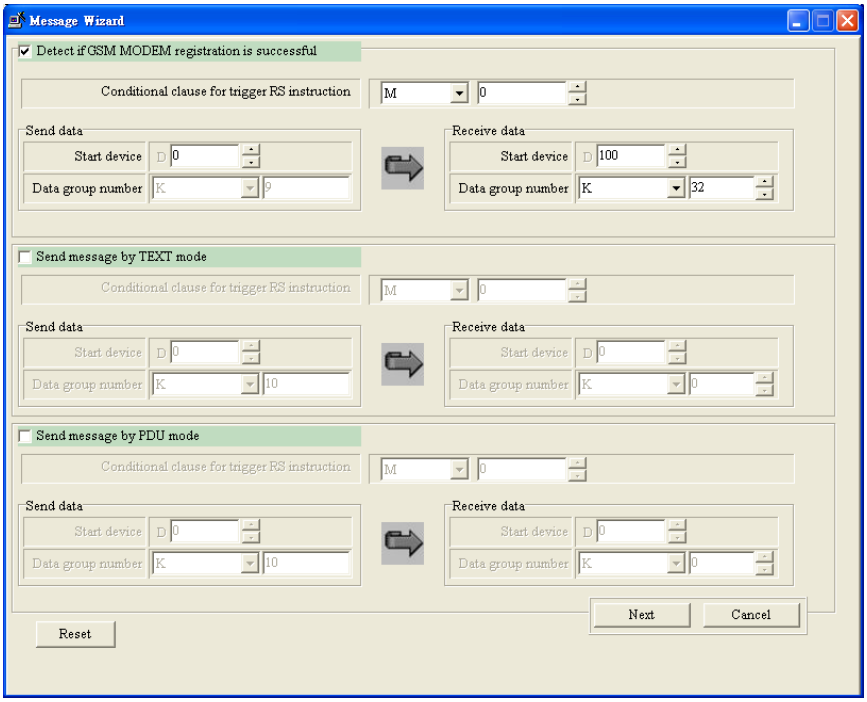
Step 2: Message wizard will automatically generate communication format 9600, 8, N, 1 (ASCII, 8-bit). Program code is as

below:

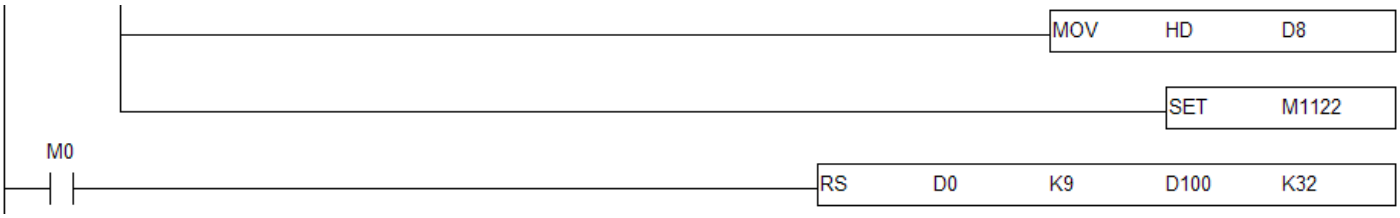
Step 3: Message wizard will detect if GSM MODEM registration is successful.

Message Wizard:

1. Tick “Detect if GSM MODEM registration is successful”
2. Conditional clause for trigger RS instruction: M0
3. Indicated start device number of send data: D0, total 9 records
4. Indicated start device number of receive data: D100. Data group number can be defined by users: K32.
5. Wizard message trigger RS instruction to send: ”A”(H41),”T”(H54),”+”(H2B),”C”(H43),”R”(H52),”E”(H45),”G”(H47), ”?”(H3F), CR(HD). Total 9 records. If registration is successful, it will reply “+”, “C”, “R”, “E”, “G”, “:”, “0”, “,”, “1”. If registration is not successful, it will reply ”+”,”C”,”R”,”E”,”G”,”：”,”0”,”，”,”2”. Program can check if GSM MODEM is able to send message from return data.



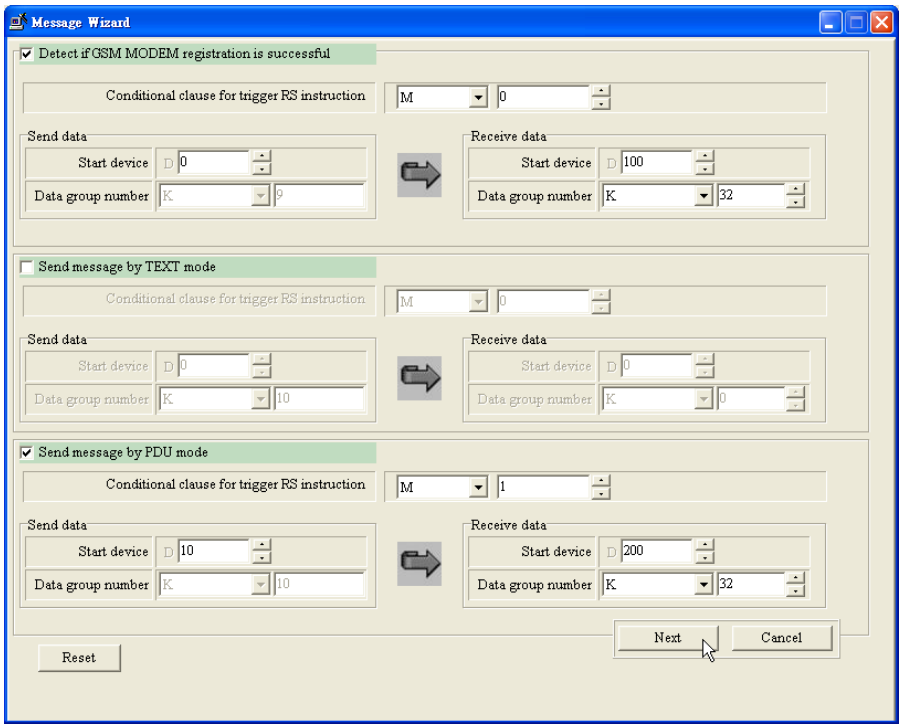
Example Program:

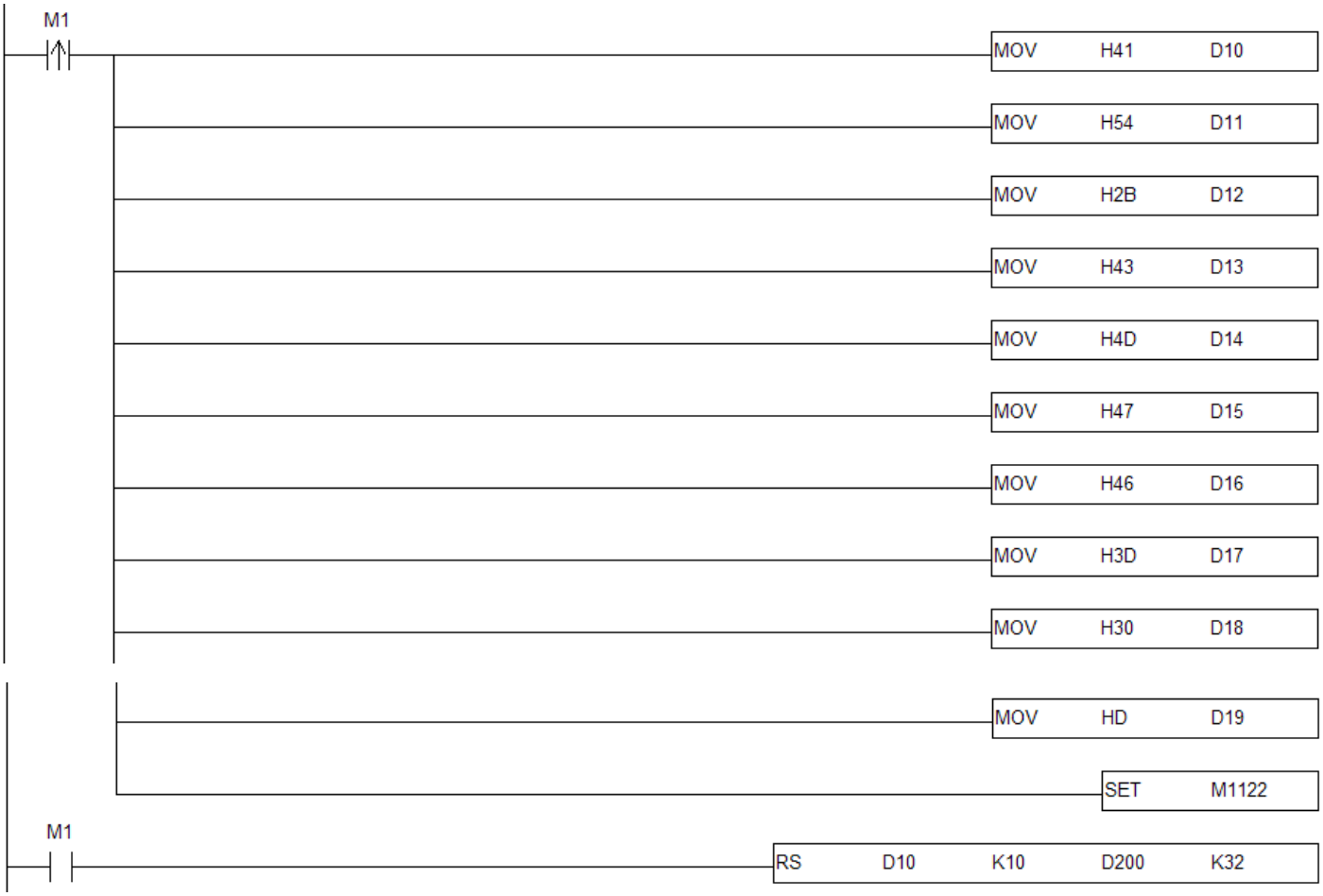


Step 4: It is able to select Chinese/English message sending in Message Wizard (PDU Mode)

Message Wizard:

1. Tick “Send message by PDU mode” to send Chinese/English message
2. Conditional clause for trigger RS instruction: M1
3. Indicated start device number of send data: D10. Data group number: 10
4. Indicated start device number of receive data: D200. Data group number can be defined by users: K32
5. Wizard message trigger RS instruction to send: ”A”(H41),”T”(H54),”+”(H2B),”C”(H43),”M”(H4D),”G”(H47), ”F”(H46),”=”(H3D),”0”(H30),CR(HD), total 10 records.





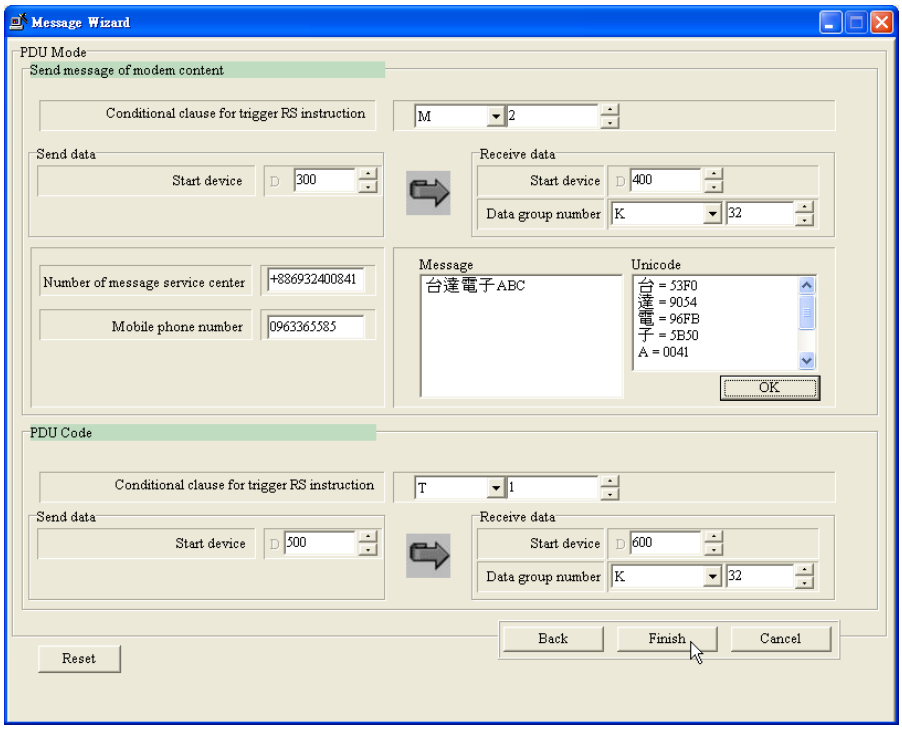
Step 5: click “Next” in Message Wizard to enter Chinese/English message mode

Message Wizard:

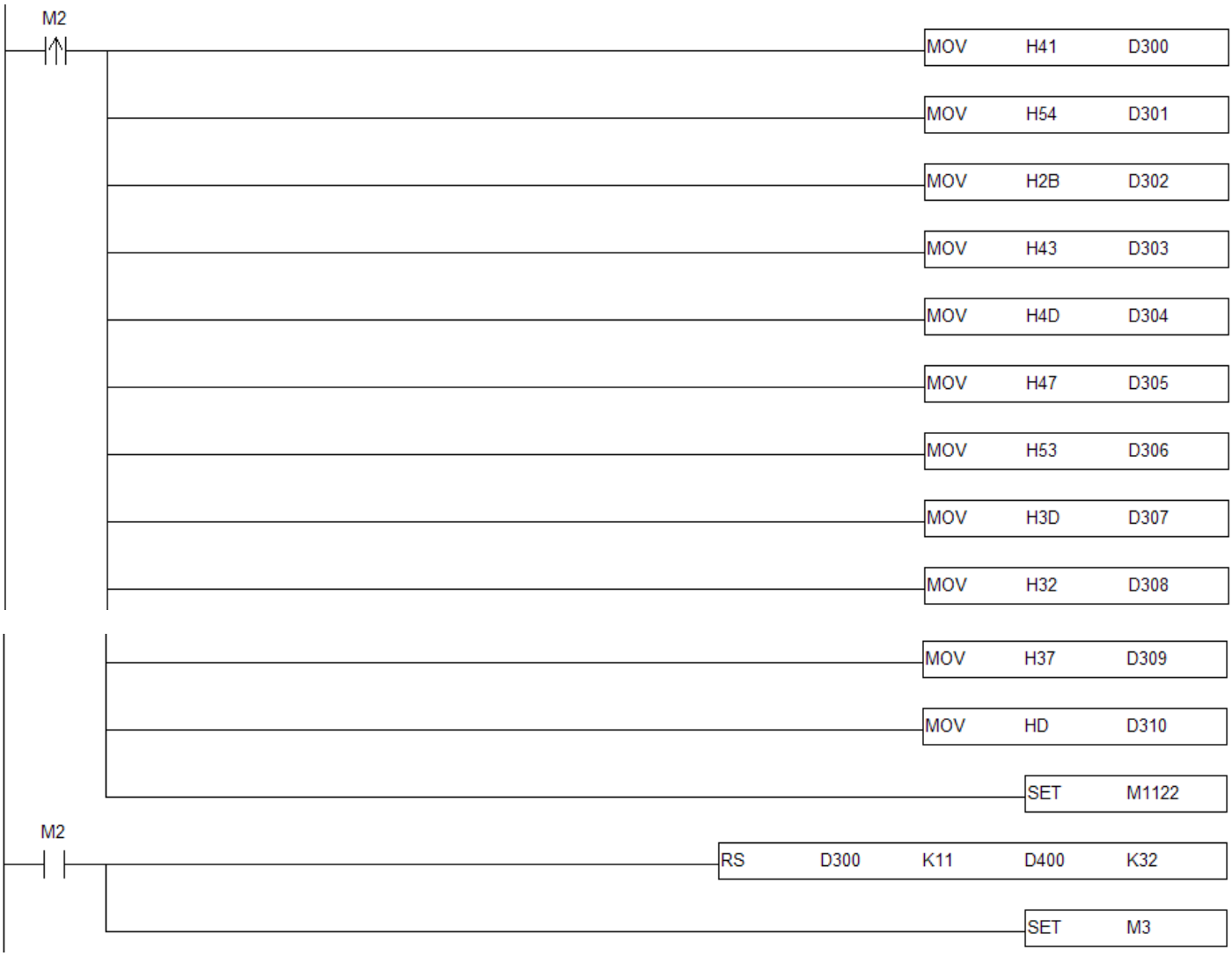
1. When select Send message dial, additional clause for trigger RS instruction is M2.
2. When select Send message dial, start device number of send date is D300, data group number is decided by the length of mobile phone number.
3. When select Send message dial, start device number of receive date is D400. Data group number can be defined by users: K32
4. Key in the phone number of message service center <0932400841, or with international dialing code <+886932400841>
5. Key in the mobile phone number to send message 0963365585, or with international dialing code +886963365585
6. Content of sending message: Delta Electronics ABC (click “OK” and then you will see the Unicode of the message in the window)
7. When select Send message, Conditional clause for trigger RS instruction is T1. Cooperate to Send message dial and set 1

second delay for data sending.

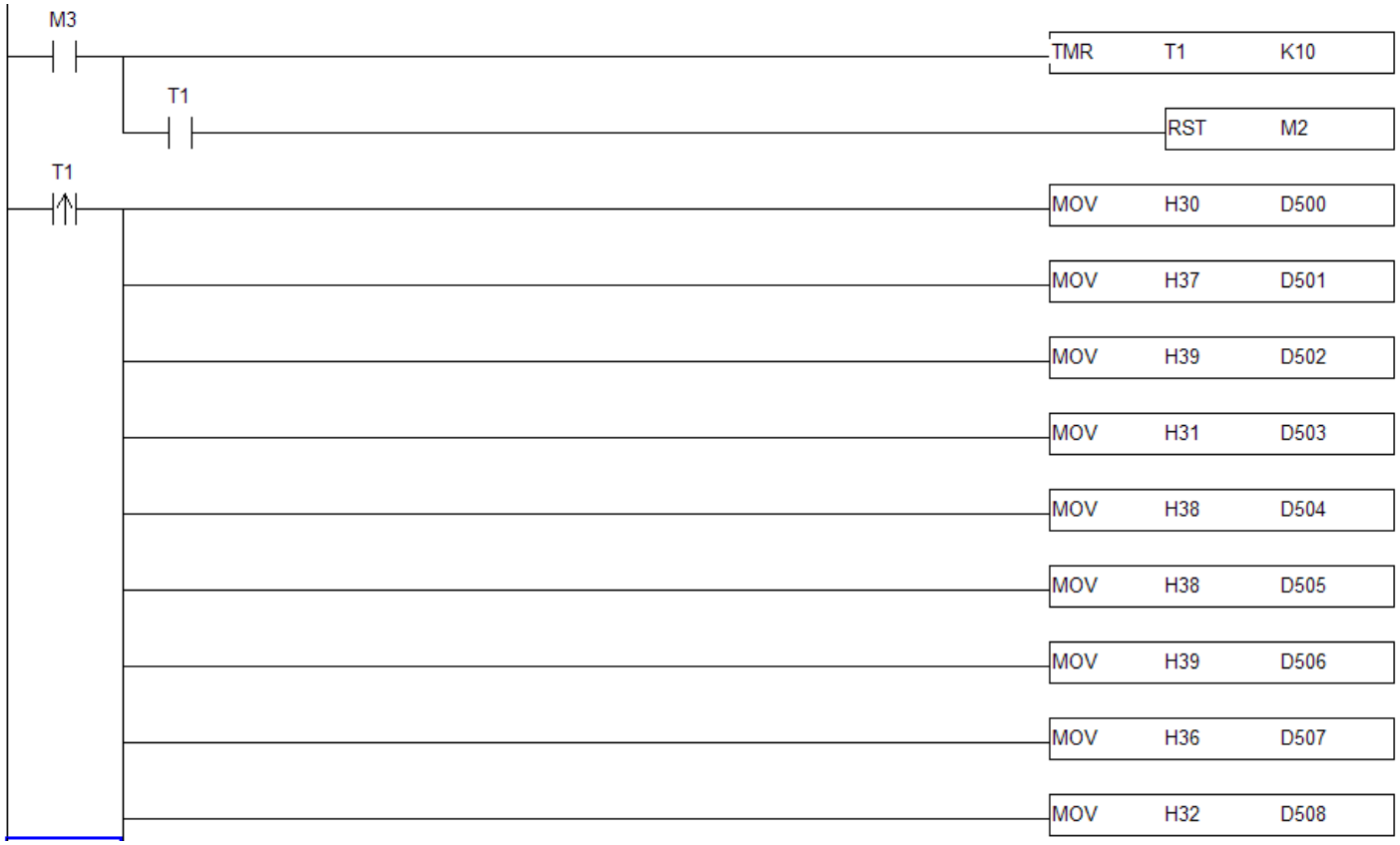
8. When select Send message, start device number of send data is D500. Data group number is decided by the length of message.
9. When select Send message, start device number of receive data is D600. Data group number is decided by users: K32
10. Message Wizard will generate RS instruction to send message (AT+CMGS=28):
    A(H41),T(H54),+(H2B),C(H43),M(H4D),G(H47),S(H53),=(H3D),2(H32),8(H38),CR(HD)
11. PDU code for sending message triggered by RS instruction: 07 91 889623048014 11 00 0C 91 88968170506100 08 A7 0E 53F0 9054 96FB 5B50 0041 0042 0043 →：
    0(H30),7(H37),9(H39),1(H31),8(H38),8(H38),9(H39),6(H36),2(H32),3(H33),0(H30),4(H34),8(H38),0(H30),1(H31),4(H34),1(H31),1(H31),0(H30),0(H30),0(H30),C(H43),9(H39),1(H31),8(H38),8(H38),9(H39),6(H36),8(H38),1(H31),7(H37),0(H30),5(H35),0(H30),6(H36),1(H31),0(H30),0(H30),0(H30),8(H38),A(H41),7(H37),0(H30),E(H45),5(H35),3(H33),F(H46),0(H30),9(H39),0(H30),5(H35),4(H34),9(H39),6(H36),F(H46),B(H42),5(H35),B(H42),5(H35),0(H30),0(H30),0(H30),4(H34),1(H31),0(H30),0(H30),4(H34),2(H32),0(H30),0(H30),4(H34),3(H33),→(H1A)
12. Click “Finish”, message wizard will automatically generate program code.

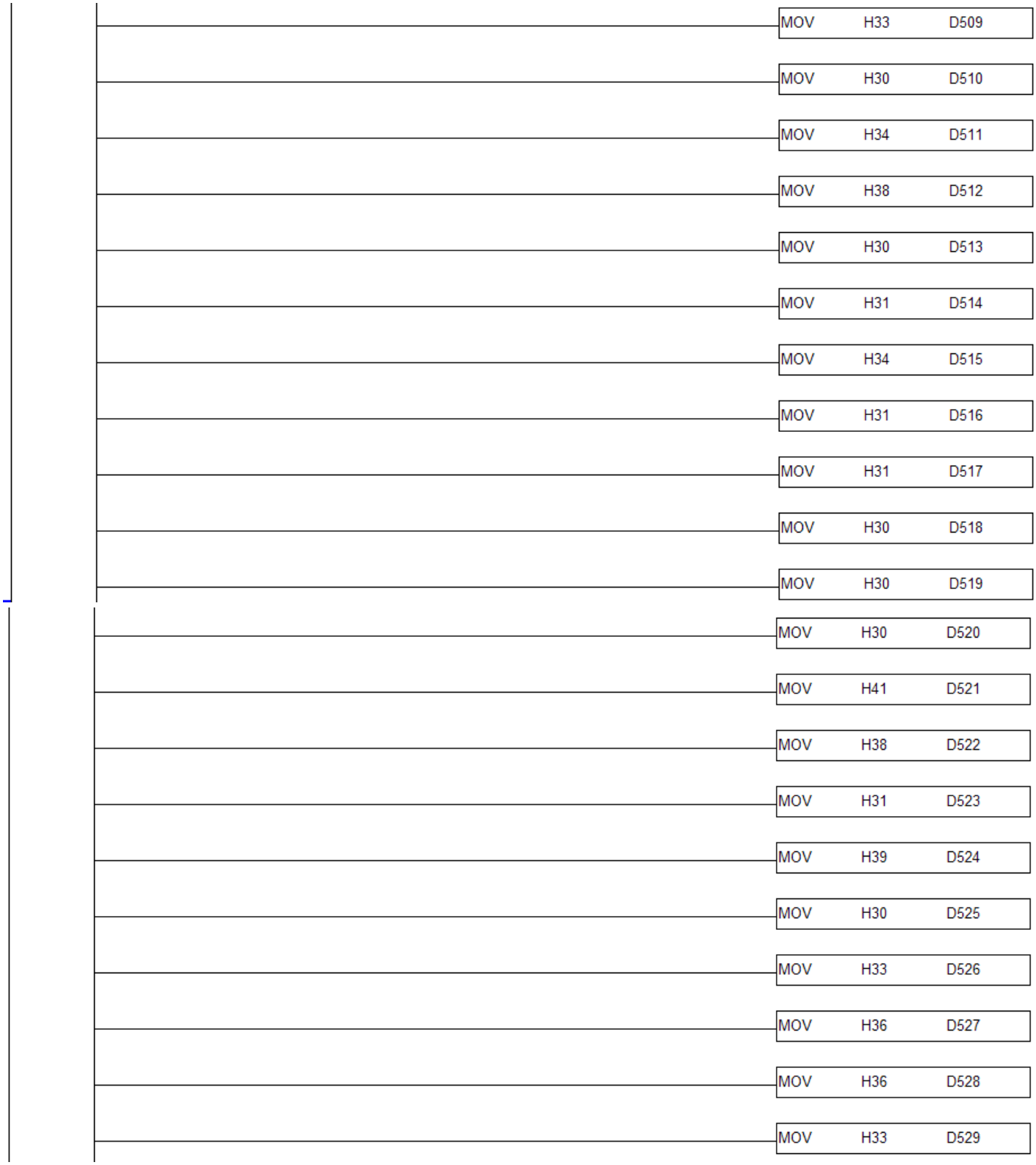


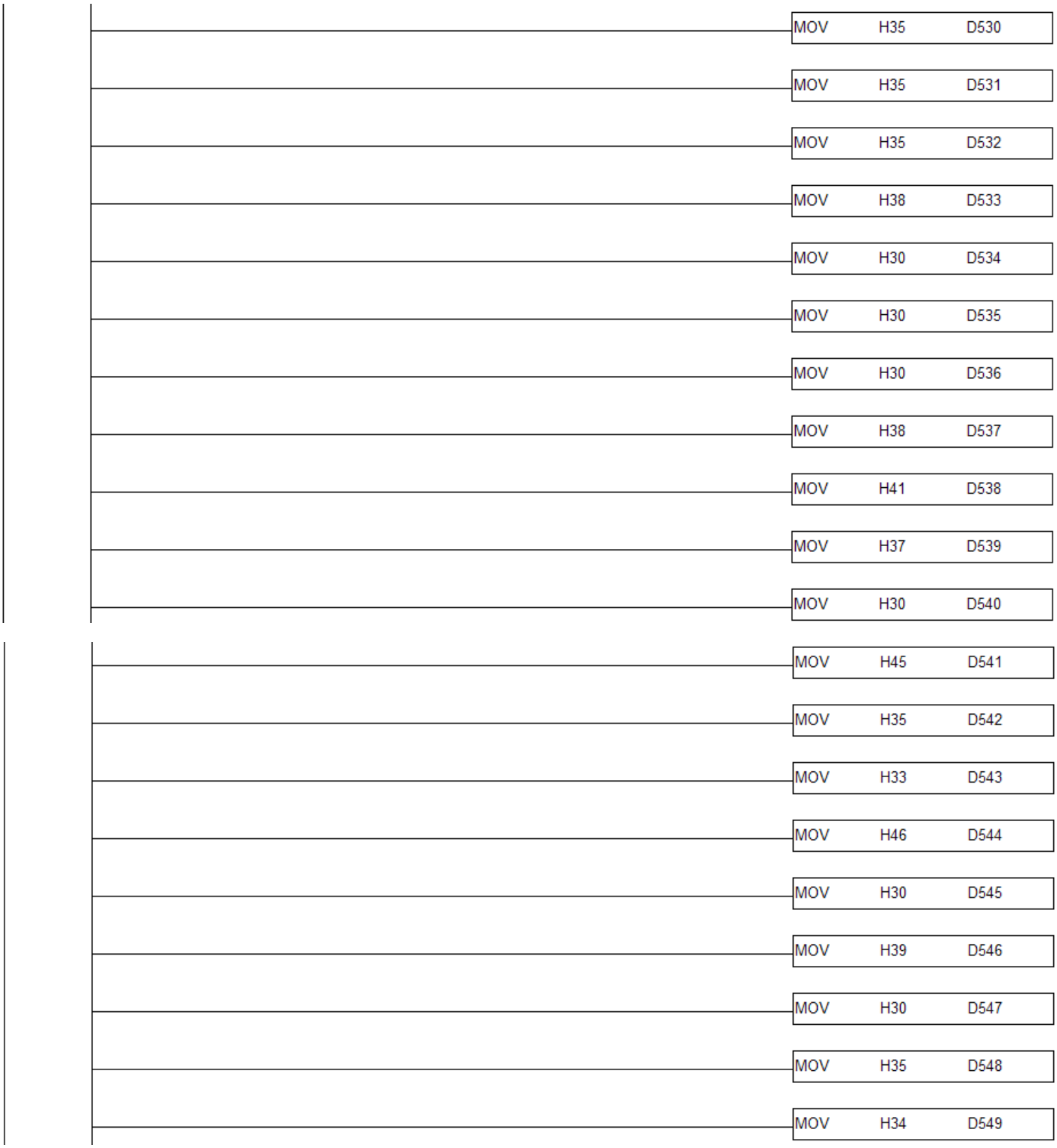
Length of message content (AT+CMGS=28)

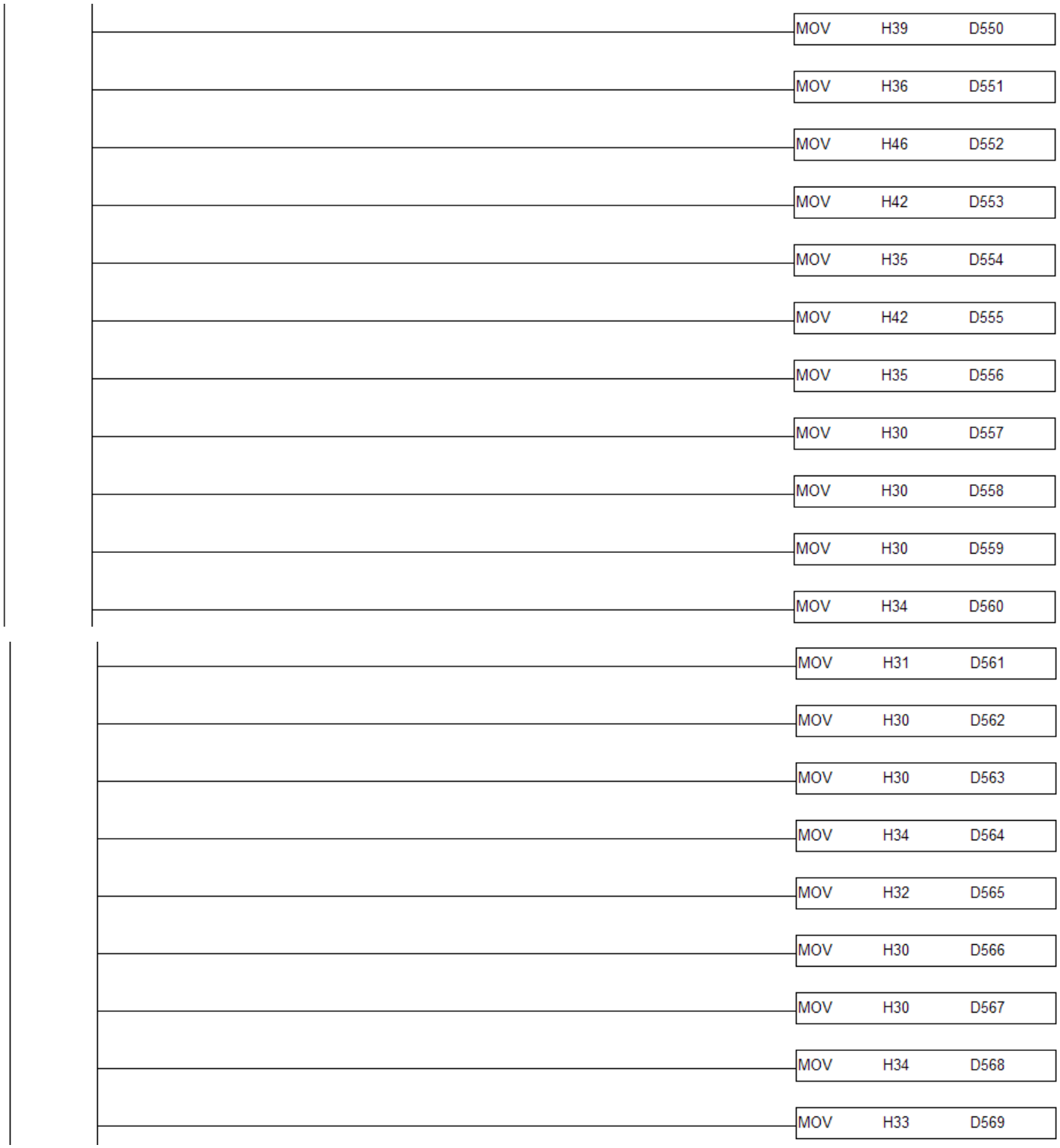


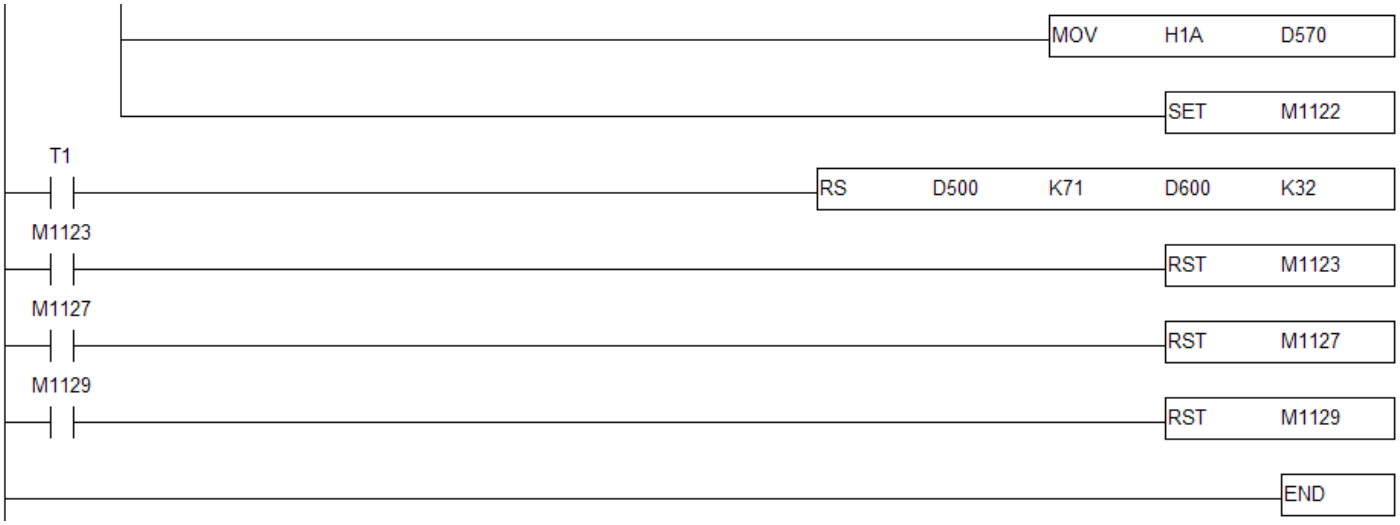
PDU code of sending message 07 91 889623048014 11 00 0C 91 88968170506100 08 A7 0E 53F0 9054 96FB 5B50 0041 0042 0043 →


M3
TMR T1 K10
T1
RST M2
T1
MOV H30 D500
MOV H37 D501
MOV H39 D502
MOV H31 D503
MOV H38 D504
MOV H38 D505
MOV H39 D506
MOV H36 D507
MOV H32 D508


MOV H33 D509
MOV H30 D510
MOV H34 D511
MOV H38 D512
MOV H30 D513
MOV H31 D514
MOV H34 D515
MOV H31 D516
MOV H31 D517
MOV H30 D518
MOV H30 D519
MOV H30 D520
MOV H41 D521
MOV H38 D522
MOV H31 D523
MOV H39 D524
MOV H30 D525
MOV H33 D526
MOV H36 D527
MOV H36 D528
MOV H33 D529

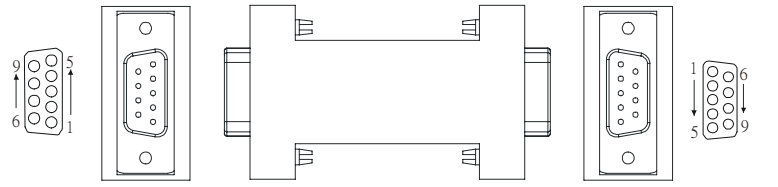

MOV H35 D530
MOV H35 D531
MOV H35 D532
MOV H38 D533
MOV H30 D534
MOV H30 D535
MOV H30 D536
MOV H38 D537
MOV H41 D538
MOV H37 D539
MOV H30 D540
MOV H45 D541
MOV H35 D542
MOV H33 D543
MOV H46 D544
MOV H30 D545
MOV H39 D546
MOV H30 D547
MOV H35 D548
MOV H34 D549


MOV H39 D550
MOV H36 D551
MOV H46 D552
MOV H42 D553
MOV H35 D554
MOV H42 D555
MOV H35 D556
MOV H30 D557
MOV H30 D558
MOV H30 D559
MOV H34 D560
MOV H31 D561
MOV H30 D562
MOV H30 D563
MOV H34 D564
MOV H32 D565
MOV H30 D566
MOV H30 D567
MOV H34 D568
MOV H33 D569


MOV H1A D570
SET M1122
T1
RS D500 K71 D600 K32
M1123
RST M1123
M1127
RST M1127
M1129
RST M1129
END

Wiring Method of PLC MPU and MODEM in Slave site:

a) Please see the following instruction to make Converter 1 that is the interface for GSM MODEM connects to the cable DVPACAB2A30 of PLC MPU. PIN detail is shown as follow:

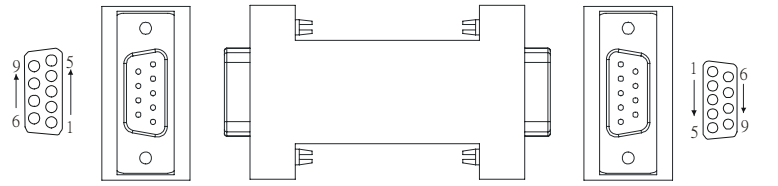


9 PIN D-SUB male　　9 PIN D-SUB male

MODEM COM Port 9 PIN D-SUB male					PLC COM1 Port 9 PIN D-SUB male			
		Tx	3	⟷	2	Tx		
		Rx	2	⟷	3	Rx		
		GND	5	⟷	5	GND		
DSR	6 —X	DTR	4	⟷	4	DTR	X— 6	DSR
CTS	8 —X	DCD	1	⟷	1	DCD	X— 8	CTS
RI	9 —X	RTS	7	⟷	7	RTS	X— 9	RI

"X" mean no used pin.

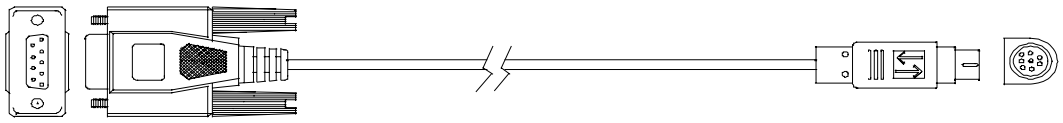
b) Please see the following instruction to make Converter 2 that is the interface for GSM MODEM connects to the cable DVPACAB2A30 of PLC MPU. PIN details are shown as follow:

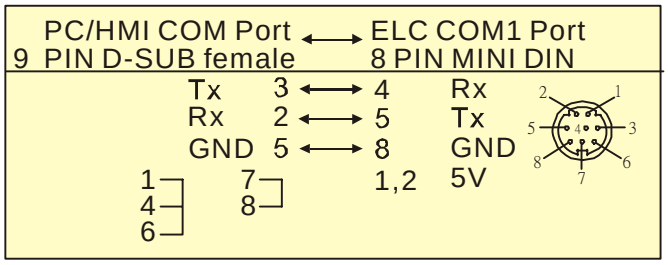


9 PIN D-SUB male　　9 PIN D-SUB male

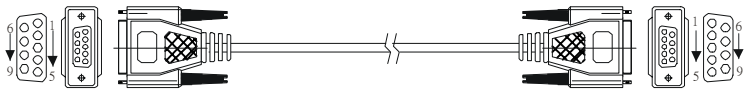
MODEM COM Port 9 PIN D-SUB male					PLC COM1 Port 9 PIN D-SUB male			
		Tx	3	⟷	2	Tx		
		Rx	2	⟷	3	Rx		
		GND	5	⟷	5	GND		
DCD	1 —X	DTR	4	⟷	4	DTR	X— 1	DCD
CTS	8 —X	DSR	6	⟷	6	DSR	X— 8	CTS
RI	9 —X	RTS	7	⟷	7	RTS	X— 9	RI

c) Use cable DVPACAB2A30 to connect with PLC COM1 (RS-232). PIN details are shown as follow:

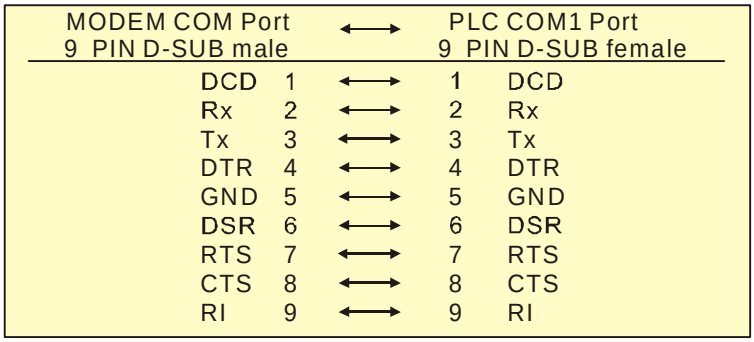




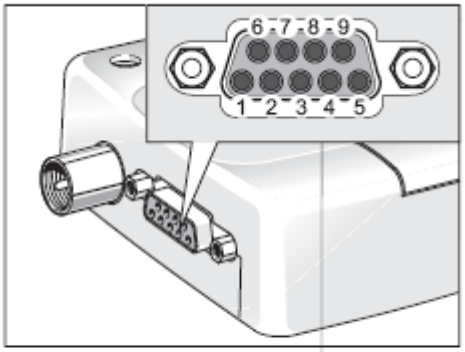
d) If the PLC is EH MPU, it is possible to connect the RS-232 of MODEM to EH MPU COM2 (DVP-F232 card) directly. EH MPU supports MODEM connection function that can be activated by setting M1184~M1188. PIN details are shown as follow:



9 PIN D-SUB male　　9 PIN D-SUB female



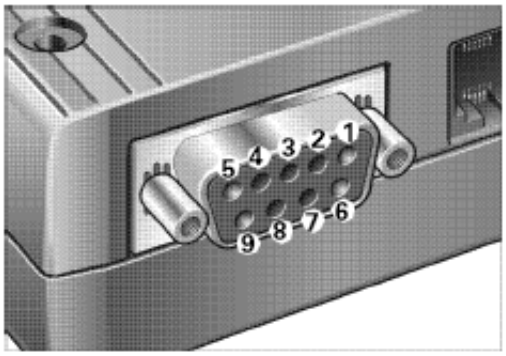
e) GM29 GSM MODEM RS-232 PIN DEFINITION



Pin	*Signal*	*Dir*	*Voltage levels*	*Description*
1	DCD	O	> +4V < –4V	Data carrier detect
2	RD	O	> +4V < –4V	Received data
3	TD	I	> 2V < 0.8V	Transmitted data
4	DTR	I	> 2V < 0.8V	Data terminal ready
5	GND	-	0V	Ground connection
6	DSR	O	> +4V < –4V	Data set ready
7	RTS	I	> 2V < 0.8V	Request to send
8	CTS	O	> +4V < –4V	Clear to send
9	RI	O	> +4V < –4V	Ring indicator

f) TC35 GSM MODEM RS-232 PIN DEFINITION

RS232 interface – 9-pin D-Sub



Signal name	PIN	I/O	Description	Parameters
DCD	1	O	The functions correspond to those of a serial interface on the basis of a V.24 protocol.	active high >5V low <–5V
RXD	2	O		logical 1=low <–5V logical 0=high >+5V
TXD	3	I		active high >2.4V low <1.8V
DTR	4	I		active high >2.4V low <1.8V
GND	5			0V
DSR	6	O		active high >5V low <–5V
RTS	7	I		active high >2.4V low <1.8V
CTS	8	O		active high >5V low <–5V
RI	9	O		active high >5V low <–5V

General parameter Explanation:

※ For more information of MODEM, please refer to each brand's user manual.

1） There are 4 parameters available inside MODEM: The active file, Profile 0, Profile 1, and Factory default profile. Profile 0, 1 are used to store user-defined parameters.

Parameter Name	Content	Memory type
The active file	Current parameter of the MODEM	RAM
Profile 0	User-defined parameter	EEPRAM
Profile 1	User-defined parameter	EEPRAM
Factory default profile	Factory setting parameter	ROM

2） Frequent instructions when initial MODEM:

Instruction	Function
ATEn	Command Echo
ATQn	Result Code Sent/Not Sent
ATZ	Soft reset and restore profile 0
ATZ1	Soft reset and restore profile 1
ATSn=v	Set the content of register the value "v" e.g. S0=1
ATSn?	To read the value stored in the register. Available range: 0~255
ATVn	Result code form
AT&C0	RLSD (DCD) Option
AT&D0	DTR Option
AT&W/W1	Store current parameter in profile0/1
AT&V	Display profile 0, profile 1, and active profile
AT&F 或 F9	MODEM restore to factory setting

◆ Use WPLSoft to orderly key in AT instruction as follows:

1. AT&F: reset MODEM to factory setting.
2. ATZ (equal to ATZ0): reset and select profile 0 as initial parameter.
3. ATS0=1&W0: save the instruction of "Auto Answer function" in profile 0.

Once the instructions above are completed, Auto Answer function of MODEM will remain ON whenever power on due to the instruction of profile 0.

◆ Also, by key in ATS0=1&W1 when initialing MODEM, AA led will remain ON when next power on. No matter what parameter will be loaded in table when next power on, the used parameter will always be ATS0=1 (Auto Answer function remain ON).